HITACHI
SERVICE MANUAL

TK | No. 2177E

VT-8E(CT) / VT-TU8E(CT)

Technical Data

VHS

THIS VIDEO DECK IS A VHS TYPE VIDEO RECORDER.
FOR PROPER OPERATION, ONLY THE VHS TYPE CASSETTE MUST BE USED.

This service manual does not describe the replacement parts list.
Refer to the "Parts List" edition for the parts list and exploded views.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

PORTABLE VIDEO DECK • VIDEO TUNER

September 1984 **TOKAI WORKS**

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SPECIFICATIONS

Video deck: VT-8E

Format:	VHS
Cassette:	VHS Type
Recording:	Rotary Two-Head Helical Scan Azimuth Recording
Tape Speed:	23.39 mm/sec. (SP), 11.7 mm/sec. (LP)
Tape Width:	12.7 mm
Operation Temperature:	0°C to 40°C
Video:	PAL colour (system I, B & G) & CCIR monochrome signal 625 line
Recording Time:	480 min. (with Hitachi E-240 cassette) (LP)
RF Output:	UHF channels 37 (30 — 39 adjustable) (system G & I)
Video Input:	0.5 — 2V p-p 75 ohm Unbalanced
Video Output:	1 Vp-p 75 ohm Unbalanced
S/N Ratio (Video):	43 dB (SP)
S/N Ratio (Audio):	43 dB (SP)
Horizontal Resolution:	Colour 240 lines (SP)
Mic Input:	−69 dB 10 Kohm
Audio Input:	−8 dB 50 Kohm
Audio Output:	−8 dB 600 ohm
Audio Frequency Range:	70 Hz to 12 kHz (SP)
Power:	DC 12V
Power Consumption:	4.7W Nominal (recording with DC 12V power supply)
Cabinet Size:	253 mm(W) x 85 mm(H) x 263 mm(D)
Weight:	3.6 kg (with Battery pack VT-BP7A)

Video tuner: VT-TU8E

Video Signal:	PAL colour (system B & G) & CCIR monochrome signal 625 line
Antenna (aerial) Input:	UHF 75 ohms
Channels Received:	VHF channels 2 — 12 UHF channels 21 — 69 CATV channels S1 — S19
RF Output:	UHF 75 ohms
Power Supply:	220V 50 Hz
Power Consumption:	40W
Dimensions:	430 mm(W) x 118 mm(H) x 290 mm(D)
Weight:	3.6 kg

Accessories Included

1 — Aerial cable
1 — Infrared remote control unit
1 — Shoulder belt
1 — Earphone
1 — Channel sheet

* Design and specifications are subject to change without notice.

SAFETY PRECAUTIONS

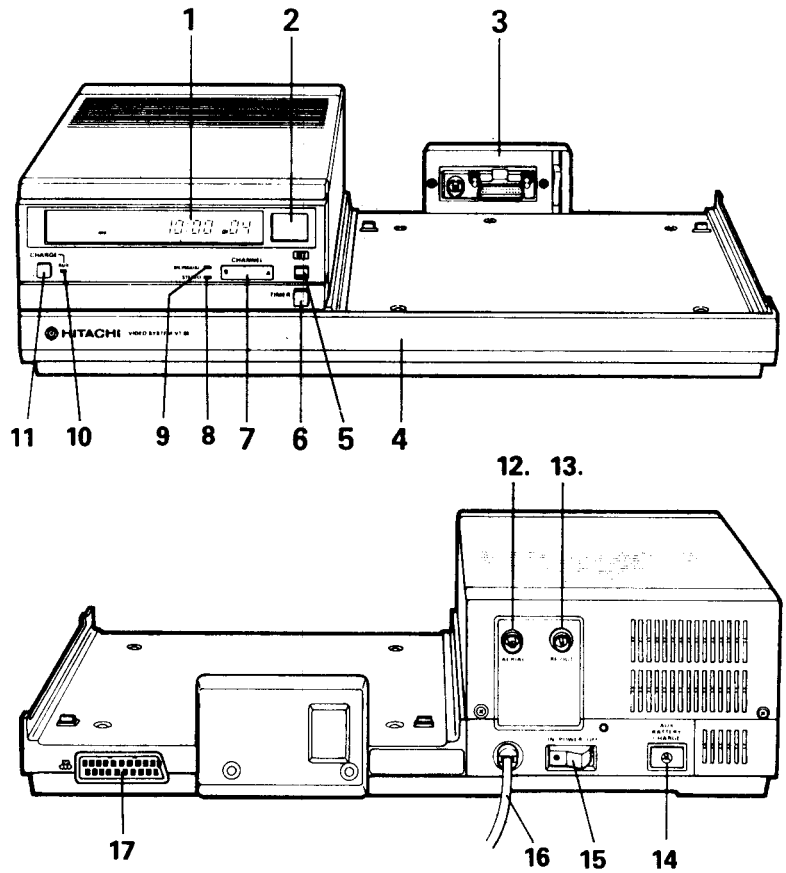
The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine Hitachi replacement parts. Especially critical parts in the power circuit block should not be replaced with other makes.
   Critical parts are marked with ⚠ in the schematic diagram and circuit board diagram.
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.

LIST OF DIFFERENCES

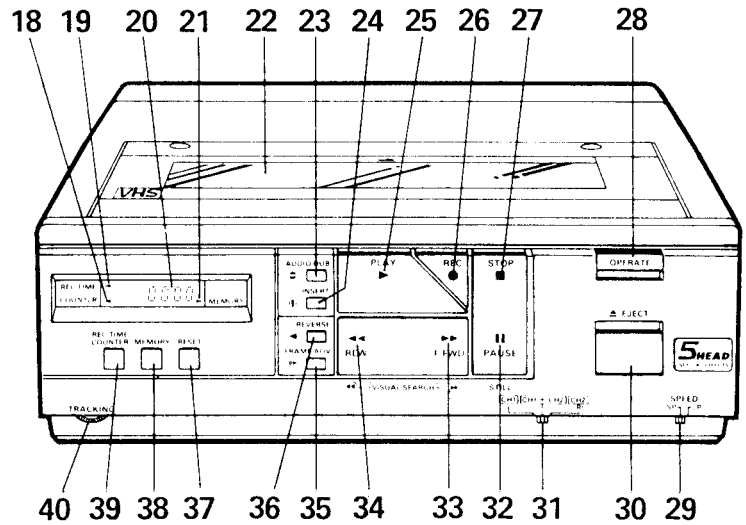
Different Section	VT-8E	VT-7E
FEATURES	**[VT-8E/VT-TU8E]**	**[VT-7E/VT-TU7E]**
REMOTE CONTROL	WIRELESS (INFRARED) CAMERA REMOTE POSSIBLE	WIRELES (INFRARED) CAMERA REMOTE POSSIBLE
RECORD PROGRAM	7-PROGRAM/2-WEEK	7-PROGRAM/2-WEEK
BATTERY	Ni-Cd (3 TERMINALS)	Ni-Cd (3 TERMINALS)
BATTERY REMAINING POWER INDICATION	"BATT" LIQUID	"BATT" LIQUID
TRICK PLAY	POSSIBLE IN SP/LP	POSSIBLE IN SP
STILL	FIELD STILL	FIELD STILL
SLOW	INTERMITTENT DRIVE FIELD SLOW (VARIABLE SPEED)	INTERMITTENT DRIVE FIELD SLOW (VARIABLE SPEED)
SEARCH NOISE LOCK	PROVIDE (SP × 5 SEARCH) (LP × 9 SEARCH)	PROVIDED (SP × 4 SEARCH) (LP × 5 SEARCH)
FRAME ADVANCE	PROVIDED	PROVIDED
REVERSE PLAYBACK	PROVIDED	PROVIDED
REEL DRIVE SYSTEM	REEL MOTOR	REEL MOTOR
TAPE COUNTER	4-DIGIT LCD	4-DIGIT LCD
RECORD TIME INDICATION	4-DIGIT LCD COUNTER	4-DIGIT LCD COUNTER
RECORD LOCK FUNCTION	PROVIDED (STOP ONLY POSSIBLE AFTER REC PAUSE WHEN CAMERA REC)	PROVIDED (STOP ONLY POSSIBLE AFTER PAUSE WHEN CAMERA REC)
STEREO RECORDING AND PLAYBACK	PROVIDED	PROVIDED
INSTANT RECORDING TIMER (IRT)	PROVIDED	PROVIDED
RECORD CHECK FUNCTION	PROVIDED (IN SYSTEM CONTROL)	PROVIDED (IN SYSTEM CONTROL)
DATING	PROVIDED	PROVED
SOUND WITH SOUND (R CHANNEL A. DUB)	PROVIDED	PROVIDED
SOUND ON SOUND	NOT PROVIDED	NOT PROVIDED
MECHANISM SECTION	**[VT-8E]**	**[VT-7E]**
VIDEO HEADS	5 HEADS 30 μm/30 μm (LP REC/PLAY, SEARCH) 57 μm/57 μm (SP REC/PLAY) 57 μm (SP TRICK PLAY)	4 HEADS 36 μm/36 μm (SP REC/PLAY) (LP REC/PLAY, SEARCH) 75 μm/75 μm (SP TRICK PLAY)
MOTORS	4 MOTORS 3-PHASE D-D CYLINDER MOTOR 3-PHASE D-D CAPSTAN MOTOR DC LOADING MOTOR 3-PHASE REEL MOTOR	4 MOTORS 3-PHAEE D-D CYLINDER MOTOR 3-PHASE D-D CAPSTAN MTOR DC LOADING MOTOR 3-PHASE REEL MOTOR
	[VT-TU8E]	**[VT-TU7E]**
CHANNEL SELECT	80 PRESET VOLTAGE SYNTHESIZED TUNER	80 PRESET VOLTAGE SYNTHESIZED TUNER
TIMER SWITCH	PROVIDED (PUSH-BUTTON, NON-LOCK)	PROVIDED (PUSH-BUTTON, NON-LOCK)
TIME SET BUTTON	NUMERAL FEED 3 BUTTONS	NUMERAL FEED 3 BUTTONS
IRT BUTTON	PROVIDED	PROVIDED
BATTERY CHARGE	SERIES CHARGE	SERIES CHARGE

CONTROLS AND FUNCTIONS – TUNER



1. **CLOCK/TIMER DISPLAY**
   Shows the present time of day and start and stop times of programmes.
2. **INFRARED RAY RECEIVING SECTION**
   Receives infrared rays from remote control unit.
3. **VTR CONNECTING TERMINAL**
   Slide the VTR onto the tuner base. Power and RF connections are made automatically.
4. **TIMER CONTROLS DOOR**
   Swing down to reveal timer and tuner controls.
5. **INSTANT RECORDING TIMER BUTTON (IRT)**
   This allows unattended recording.
   The timer will switch VTR off automatically at a preselected time. This is convenient when you go out during recording.
6. **TIMER RECORD SWITCH**
   Press after programming Digital Clock.
7. **CHANNEL UP/DOWN SELECT BUTTON**
   Allows you to scan preprogrammed channels. Refer to page 8 for details.
8. **STEREO INDICATOR**
   Will light when the stereo broadcast is tuned.
9. **BILINGUAL INDICATOR**
   Will light when the bilingual broadcast is tuned.
10. **AUXILIARY BATTERY CHARGING INDICATOR**
    Will light when charging battery connected to the AUX battery charge terminal on back of the tuner.
11. **CHARGE BUTTON AND INDICATOR**
    Press for battery charging. Indicator will light when charging battery installed in the VTR.
12. **AERIAL INPUT SOCKET**
    Connect external aerial.
13. **RF OUTPUT**
    Connect to TV aerial input.
14. **AUXILIARY BATTERY CHARGE TERMINAL**
    A second rechargeable battery (VT-BP7A) connected with battery connector can be plugged in here for charging.
15. **MAINS POWER SWITCH**
    Mains Power ON-OFF switch.
16. **MAINS LEAD**
17. **PERI JACK**
    Connect this jack to the PERI jack on TV with PERI Cable. Refer to page 3.

CONTROLS AND FUNCTIONS – FRONT OF VTR



18. **COUNTER INDICATOR**
Comes on when the REC TIME/COUNTER select button is in "COUNTER" position.

19. **RECORD TIME INDICATOR**
Comes on when the REC TIME/COUNTER select button is in "REC TIME" position.

20. **REC TIME/COUNTER DISPLAY**
Indicates relative position of programmes on tape or indicates record elapsed time. It may be used to help to locate a programme's starting point or to determine the elapsed recording time.

21. **MEMORY INDICATOR**
Comes on when the Counter MEMORY button is turned on.

22. **CASSETTE HOLDER**

23. **AUDIO DUB BUTTON**
Press AUDIO DUB button and while holding AUDIO DUB, press PLAY button to audio dub.

24. **INSERT BUTTON**
This button is used when recording the desired scene or title on a previously recorded tape.

25. **PLAY BUTTON**

26. **RECORD BUTTON**
Press RECORD button and while holding RECORD, press PLAY button to record.

27. **STOP BUTTON**
The STOP button must be pressed between "RECORD" and any other operation.

28. **OPERATE SWITCH**
Turn system power on and off.

29. **SPEED SELECT SWITCH**
Select standard play (SP) or long play (LP). Only use this switch when recording. Playback speed automatically corresponds with recording speed.

30. **EJECT BUTTON**
Press to remove cassette. The STOP button must be pressed before "EJECT".

31. **AUDIO CHANNEL SELECT SWITCH**
Selects the audio source to be output.

32. **PAUSE/STILL BUTTON**
Press to pause during recording.
Press to view still frame during playback.
Press again to release.

33. **FAST FORWARD/VISUAL SEARCH BUTTON**
Press to activate fast forward.
Press this button during playback.
Forward playback picture at high speed can be seen.

34. **REWIND/VISUAL SEARCH BUTTON**
Press to start rewind.
Press this button during playback.
Reverse playback picture at high speed can be seen.

35. **FRAME ADVANCE BUTTON**
Press to view tape one frame at a time. Hold down button to advance frames continuously.
Operates only after PAUSE/STILL button has been pressed during playback.

36. **REVERSE BUTTON**
Press to view picture in reverse direction at normal speed during playback.

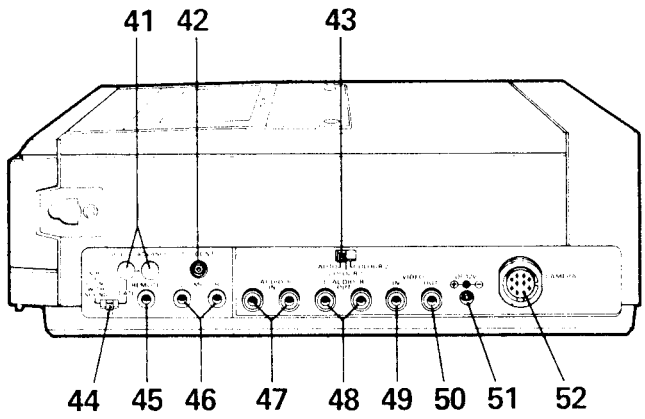
37. **RESET BUTTON**
To reset counter to "0000".

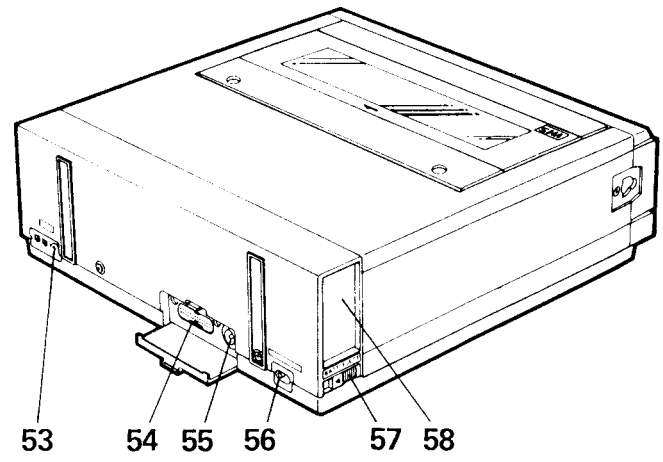
38. **COUNTER MEMORY BUTTON**
When this button is ON, tape will stop at approximately "0000" reading.

39. **REC TIME/COUNTER SELECT BUTTON**
Press to select the record time display or counter display.

40. **TRACKING CONTROL KNOB**
To minimize noise in playback.

CONTROLS AND FUNCTIONS — BACK AND SIDES OF VTR





41. **DATE SET BUTTONS**
Allow you to record the date on the tape.

42. **TV CONTROL**
For connection with a TV with a DIN jack using an exclusive cable. See your dealer for details.

43. **VIDEO MODE SWITCH**
AUTO: Circuits are automatically switched to colour or black/white mode. Set to this position when playing or recording PAL signal.
COLOUR 1: When recording PAL signal in the area very far from broadcasting station, recorded picture may lose colour. In that case set to this position in recording and playback.
COLOUR 2: When recording SECAM (system B&G) signal, set to this position in recording and playback.

44. **NOISE REDUCTION/SOUND-WITH-SOUND/DATE SWITCH**
Set to the left to reduce tape hiss or noise during playback, or to audio dub to record a new sound on the right soundtrack of tape with left soundtrack left as it is. Set to "OFF" for normal use. This position is used to audio dub when recording new sound with the previous sound completely erased.
Set to the right to record the date.

45. **REMOTE CONTROL SOCKET**
Plug the remote control unit here.
Note: Be sure to turn off the Operate switch of the VTR when connecting the optional remote control unit.

46. **MICROPHONE SOCKETS**
For microphones.

47. **AUDIO IN**
Receive audio signals from external sound equipment or from another VTR.

48. **AUDIO OUT**
Permits audio connection of your unit to a monitor or another VTR. Or connect the earphone provided to monitor during recording.

49. **VIDEO IN**
Receives video signal from another VTR.

50. **VIDEO OUT**
Permits video connection of your unit to a monitor or another VTR.

51. **EXTERNAL BATTERY SOCKET**
Car battery cord plugs in here to connect VTR to car cigarette lighter socket or to a spare rechargeable battery with the optional battery connector VT-BH7A.

52. **CAMERA INPUT SOCKET**
Camera is connected here.
Automatically overrides any other input video signal.

53. **VIDEO CHANNEL CONTROLS**
Set the video channel correctly. See page 7 for details.

54. **TUNER CONNECTION TERMINAL**
This allows you to connect the VTR to your tuner easily.

55. **RF OUT**
When the VTR is not connected to the tuner, the coaxial connector cable provided attaches here to connect your VTR and TV or monitor for playback.

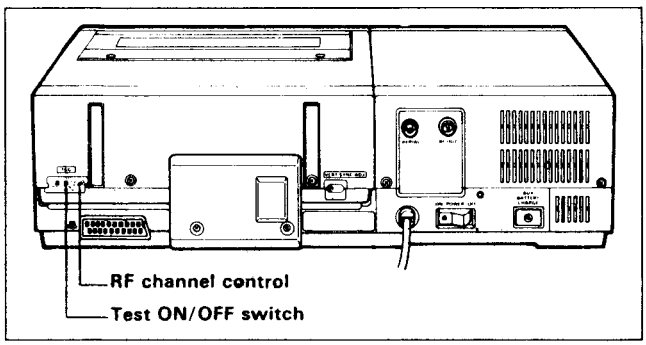
56. **VERTICAL JITTER CONTROL (VERT. SYNC. ADJ)**
Correct vertical jitter if it occurs during still playback.

57. **BATTERY EJECT KNOB**
Slide knob in direction of arrow to remove rechargeable battery.

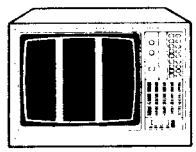
58. **BATTERY COMPARTMENT**
Door opens when rechargeable battery is inserted.

VIDEO CHANNEL SETTING

The RF converter changes the video and audio signals from a previously recorded video tape during playback to the same type of signal used for TV broadcasts. The RF converter output in this unit is pre-set prior to shipment to UHF channel 37.



1. Turn TV on and select an unused channel (CH37), in some cases this may be marked A/V.
2. Turn the OPERATE switch on.
3. Set the test ON/OFF switch to "ON". Then tune the TV until the test pattern shown below is received and the test tone signal is heard clearly.



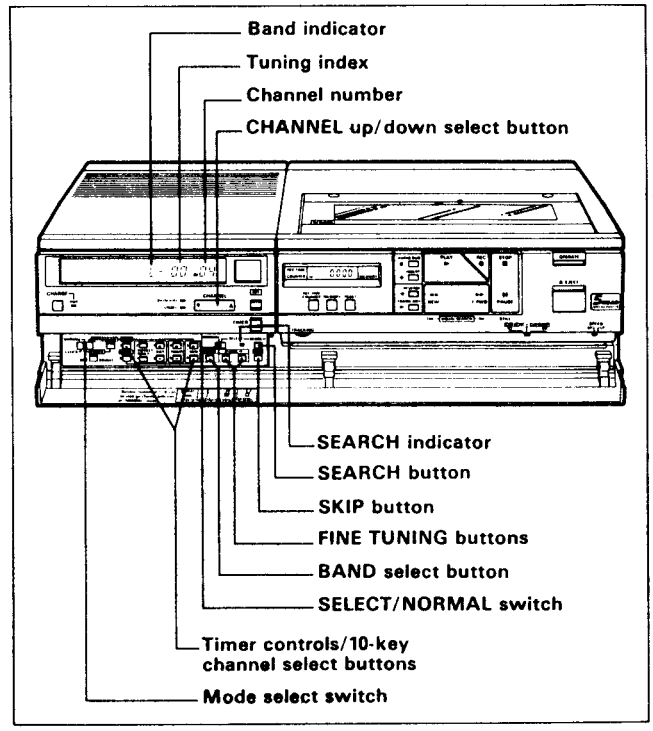
4. If it is not possible to correctly tune to the test pattern or channel 37 is used for broadcasting in your area, adjust the RF converter output with the RF channel control, using a small screwdriver and re-adjust your TV if necessary until the test pattern is observed.
   For higher channel numbers, turn clockwise.
   For a lower channel, turn counterclockwise.
5. Having completed the adjustment, set the test ON/OFF switch to "OFF".

When connecting the video tuner to a TV set provided with auto-tuning, and the video channel cannot be set, operate as follows:

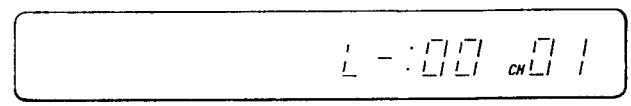
1. Remove the aerial cable from the AERIAL terminal on the video tuner.
2. Leave the test ON/OFF switch "OFF".
3. Playback a blank tape.
4. Press the PAUSE/STILL button to obtain the pause mode.
5. Press the Auto-tuning button.
6. Auto-tuning starts and it stops at video channel 37.
   Note: The auto-tuning indicator of the TV set changes to an exact tuning indicator.
7. Set the channel memory of the TV set to ON and store the channel which was set in item 6.
8. Set the test ON/OFF switch to ON and check the picture appears on the TV screen.
   Now, the video channel of TV set has been set properly.
9. Return the test ON/OFF switch to "OFF".
10. Reconnect the aerial cable to the video tuner.

PRE-TUNING OF BUILT-IN TV TUNER

This deck incorporates a complete television tuner with the required tuning controls. Once you have pre-tuned to preferred stations, you can select any of them by merely pressing CHANNEL select button.

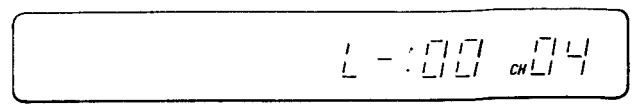


1. Turn TV on and select the pre-tuned video channel.
2. Turn on the OPERATE switch on the VTR.
3. Swing down the Timer controls door for access pre-tuning controls.
4. Set the SELECT/NORMAL switch to "SELECT".
   The SEARCH indicator will light and the display indication changes from the clock time display to the band indicator and tuning index displays.



5. Press the CHANNEL select button to select the channel number to be memorized.
   Note: The channel number will flash on and off to indicate that the channel number has not been preset. If the channel has been preset, the number will not flash.
   Some channel numbers have been preset at random. These numbers will not flash when displayed.

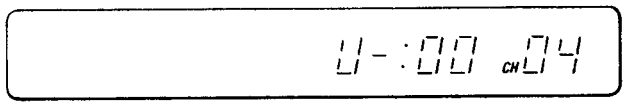
   You should determine which channel memory positions have not been preset before entering programming information. New information automatically erases previously programmed data.



For example, the above diagram shows that channel 4 has been selected.

6. Press the BAND select button to select the desired band to be pre-tuned.

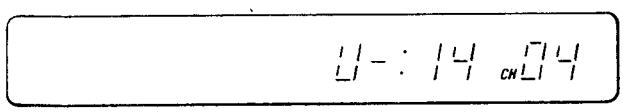
   If you pre-tune to the VHF Low channels 2-4 or CATV channels S1 and S2, select the indication "L". Select "H" for VHF high channels 5-12 or CATV channels S3 through S19, and "U" for UHF channels.
   Indication on the display will change in sequence L, H, U, L .... continuously when this button is pressed.



   For example, above diagram shows that the UHF band has been selected.
7. Press the SEARCH button to start tuning..
   The SEARCH indicator flashes on and off and the tuning index advances continuously.
   At a station that is broadcasting, the tuning index stops advancing and the SEARCH indicator lights to show the station has been preset in memory.
   The programmed picture appears on the TV screen.
   If the station received is not required to be preset, press the SEARCH button again. At the next station, the channel index will stop advancing and the SEARCH indicator will light, and the new station can be preset. Repeat this until the desired station is reached. By repeating this, the Band indicator on the display will change in sequence L, H, U, L .....

   If your TV picture is not clear, you must perform fine tuning. Press and hold the FINE tuning button (forward or reverse) until a clear picture is obtained.
   In this case the AFS* facility is automatically cancelled only for the channel being fine tuned.

   *** AFS (Automatic Frequency Setting)**
   An AFS circuit is employed in this video tuner. This AFS circuit automatically maintains best obtainable channel reception for optimum recording quality. However, the AFS facility is automatically cancelled and best picture is obtained when you fine tune the channel by pressing the FINE tuning button.



   For example, the above diagram shows that an UHF station has been set in memory channel 4.
8. Follow the same steps as explained in steps 5 through 7 above for other channels.
9. After having completed tuning all channel memories you want, return the SELECT/NORMAL switch to "NORMAL".

These channels preset in memory as shown in the above can be selected by the CHANNEL up/down select button or 10-key controls on the tuner or infrared remote control unit.

The provided channel sheet is used to list programmes to which you will preset your video tuner. List the programmes and paste sheet on the side panel or the bottom of the remote control unit etc. so as not to hinder you when you operate the unit.

Channel selection

10-key selection

The Tuner and the infrared remote control unit equipped with a 10-key pad for direct channel selection. To obtain the channel you want, two numbers must be pressed. For example, press "0" and "8" for channel 8. 80 channels can be preset in memory. If you display other channels, for example, if you display "83" on the display, channel "83" is not held in memory, accordingly after 2 seconds channel "83" returns to the last preselected channel.

NOTE: The 10-key pad can be used for channel selection when Mode select switch is in the "NORMAL" position.

Channel up/down selection

In addition to the individual channel selection controls, the channel up and down control on the tuner and the infrared remote control unit permits advancing the tuner directly to the next higher or lower programmed channel. Holding the CHANNEL up/down button depressed lets you scan programmed channels, stopping briefly at each to let you see the programme.

Eliminating unwanted preset channels

You can rearrange the desired channels by eliminating unwanted preset channels for channel up/down tuning.

1. Press the CHANNEL up/down select button until an unwanted channel is found.
2. Set the SELECT/NORMAL switch to "SELECT".
   The SEARCH indicator will come on.
3. Press the SKIP button.
   The SEARCH indicator will go off.
   The channel has been erased from memory.
4. Repeat steps 1 and 3 until all unwanted channels have been erased.
5. After eliminating them, return the SELECT/NORMAL switch to "NORMAL".

The channels which have been erased cannot be selected by the CHANNEL up/down select button, but can be selected by the 10-key buttons on the tuner or the infrared remote control unit.

Adding channels

Channels can be newly added as described in "Pre-tuning of built-in TV tuner", and you can also preset channels again which have previously been eliminated because they were unwanted.

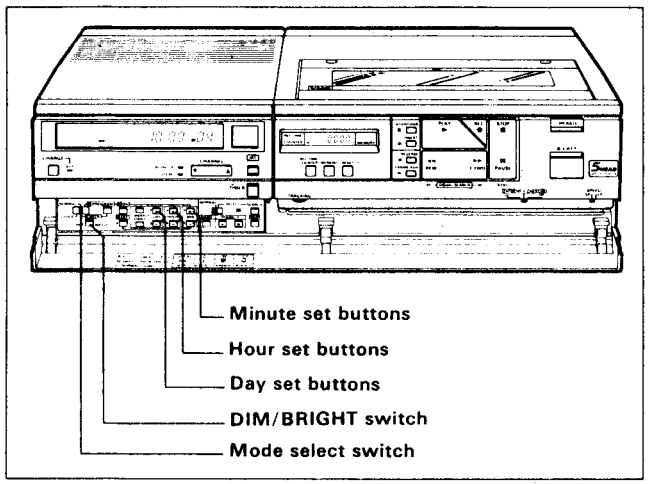
Proceed as follows:

1. Using the 10-key pad, select the channel which had been previously eliminated and you desire to preset again into the memory. The picture can be viewed on the TV screen.
2. Set the SELECT/NORMAL switch to "SELECT". (The SEARCH indicator should go off.)
3. Press the SKIP button.
   The SEARCH indicator will come on. The channel has been programmed in memory.
4. Repeat steps 1 and 3 for other channels if desired.
5. After adding channels, return the SELECT/NORMAL switch to "NORMAL".

These programmed channels can be selected by the CHANNEL up/down select button.

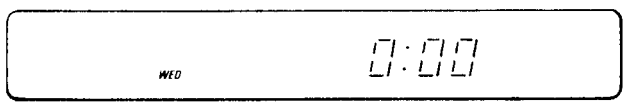
CLOCK TIME SETTING

The built-in digital clock is based on a 24 hour cycle and gives you a constant readout of the time and day.

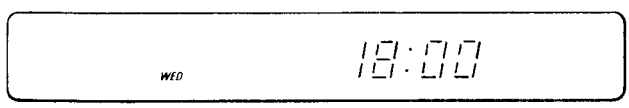


- When the MAINS lead is plugged in for the first time, the digital clock display flashes "SUN 0:00".

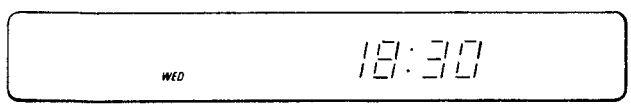
1. Set the Mode select switch to "CLOCK".
2. Press the DAY button (forward or reverse) to select the present day of the week.
   The display stops flashing.
   Hold the button down to advance rapidly.



   For example, the above diagram shows that Wednesday (WED) has been set.
3. Press the HOUR button (forward or reverse) to set the present hour of day.
   Hold the button down to advance rapidly.



   For example, the above diagram shows that "18" hours have been set.
4. Press the MINUTE button (forward or reverse) to set the minute of day.
   Hold the button down to advance rapidly.



   For example, the diagram shows that "30" minutes have been set.

Now the clock has been set to the correct time of day.

5. Return the Mode select switch to "NORMAL".
   If the switch is left at "CLOCK", the clock will not advance.

   For zero second setting, set minutes to one minute ahead of present time and move the Mode select switch to "NORMAL" when the exact start of the next minute is reached.

Note: When a power failure occurs or the mains lead is disconnected from the AC outlet for less than approximately 60 minutes, the "PF" indicator flashes to warn you.
Or, if your clock display flashes "SUN 0:00", your home had a power failure for more than 60 minutes. The time should be reset.

The "PF" indicator will disappear when the Mode select switch is returned to "NORMAL" after moving this switch to "CLOCK".

Select the desired intensity level of display by pushing the DIM/BRIGHT switch.

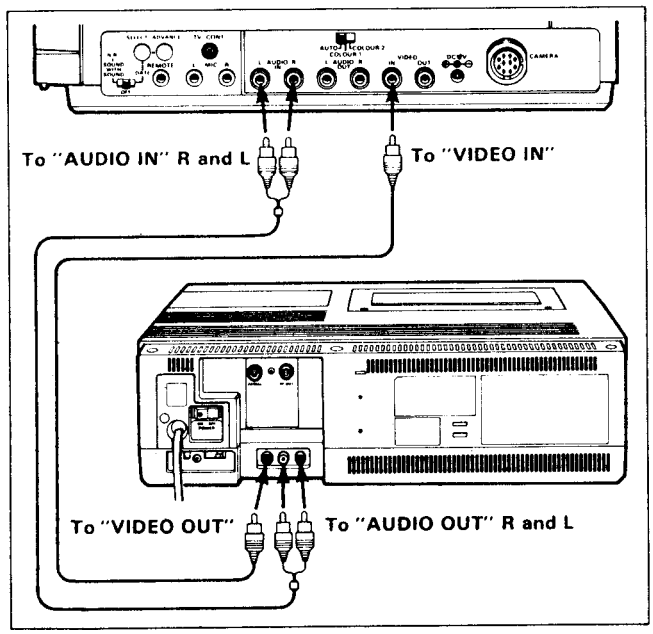
STEREO RECORDING/PLAYBACK

Stereo/bilingual broadcast recording

Stereo and bilingual broadcasts are automatically recorded when they are tuned. See "RECORDING TV PROGRAMMES" on page 10 for operation. To monitor stereo sound during recording, connect the VTR and stereo system with audio cable. (See "Stereo playback"). See instruction manual of stereo system for operation.

Stereo recording connected to another stereo video deck

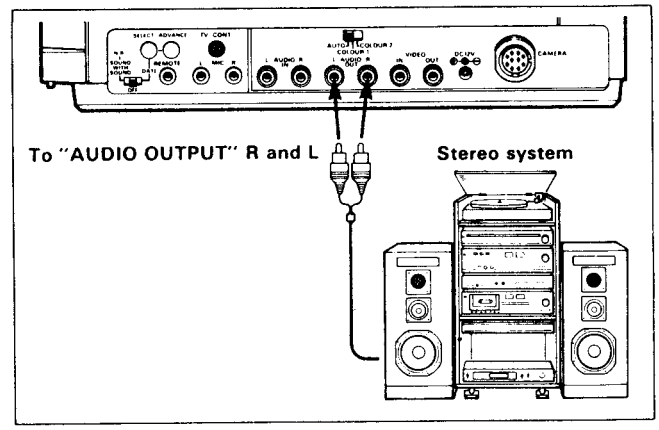
This allows you to copy tapes with stereo sound by playing back a prerecorded stereo tape on another video deck.



1. Connect audio cables to the AUDIO IN (R and L) of your video deck and to the right and left audio output jacks of the other video deck.
2. Connect the video cable to the VIDEO IN of your video deck and to the video output jack of the other video deck.
3. Playback the prerecorded stereo tape on the other video deck.
4. Record it with your video deck.

Stereo playback

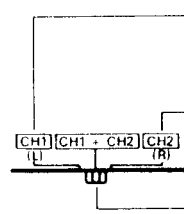
This allows you to play back a prerecorded stereo tape in stereo.



1. If your TV set connected with this VTR is a stereo unit, the above connection is not necessary.
   If it is not, connect audio cables to the AUDIO OUT (R and L) of your VTR and to the right and left audio input jacks of your component stereo system.
2. Then follow the steps for playback on page 12 except set the AUDIO CHANNEL select switch to the center position "CH1 + CH2".
   Refer to the instruction manual of stereo system for operation.

AUDIO CHANNEL select switch

This switch can be used as follows by selecting it during recording and playback.



- Set to "CH1(L)" to monitor the left audio channel.
- Set to "CH2(R)" to monitor the right audio channel.
- Set to the center position "CH1 + CH2" to monitor both right and left audio channels.

TIMER RECORDING (UNATTENDED RECORDING)

The programmable electronic clock/timer permits the unattended recording of up to 7 preselected programmes. It can be preset up to 14 days in advance to record your favorite programmes. It turns the unit on and off and changes channels automatically.

Preparations for timer recording

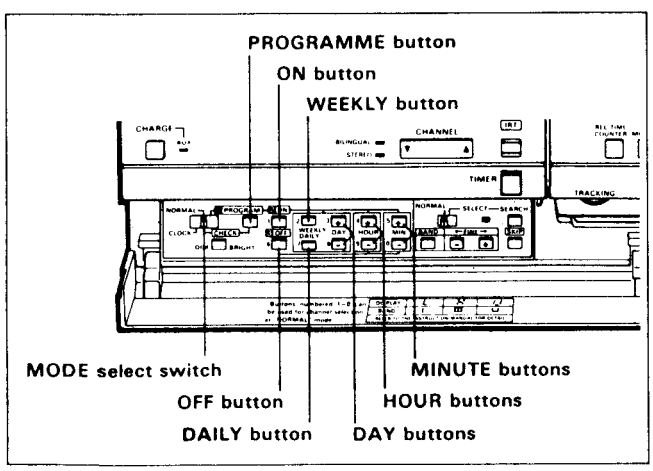
- Your TV does not have to be on to make a recording because the VTR records TV programmes without the aid of your TV. Its only use is for monitoring.

1. Make sure that the clock shows the present time and day correctly.
2. The OPERATE switch may be on or off.
3. Insert a cassette.
   Be sure to check that the record safety tab is not missing. If the record safety tab is missing, recording will not begin.
4. Set the SPEED select switch to "SP" or "LP".
   It is recommended to set this switch to "SP" to obtain the best picture and sound quality.
5. Programme the timer.

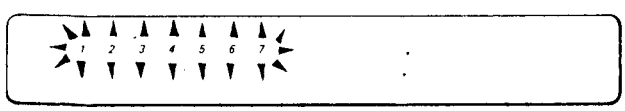
Programming the timer for unattended recording

For unattended recording the timer needs to know what **day** to make the recording, the **time to start**, the **time to stop**, and the **channel to be recorded**.

Note: For access to clock/timer controls, Timer controls door opens downwards.



1. Set the MODE select switch to "PROGRAM". Programme indicators (1 through 7) flash to indicate which memory positions have not been programmed. If a memory has been programmed, its indicator will not flash.



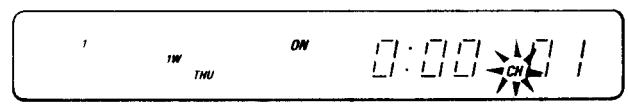
Note: You should determine which memory positions have not been programmed before entering new programming information. New information automatically erases previous programming.

2. Press the PROGRAMME button until desired Programme indicator lights. Programme indicators (1 through 7) light, in sequence, across top of Digital Display. ON indicator flashes to tell you to press the ON button.

For example, above diagram shows programme "1" has been set.

3. Press the ON button.
   The present day, 1W, 0:00 and channel number will appear. The letters "CH" will flash until you enter the channel number to be recorded.

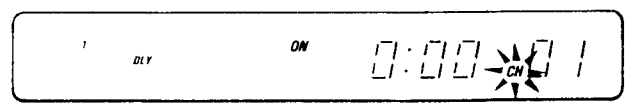
4. Select the day of recording by pressing the DAY (forward or reverse) button until desired Day indicator lights. **Make sure desired Week indicator (1W or 2W) lights**. Continuing forward will advance Timer to Week Two.



For example, above diagram shows recording on Thursday within 1 week from today.

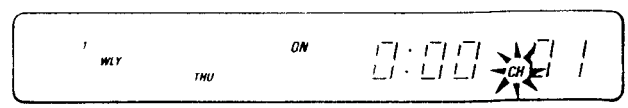
To record at the same time every day of the week:

Press the DAILY button. "1W" and the present day "TUE" will disappear and "DLY" will appear in the display.



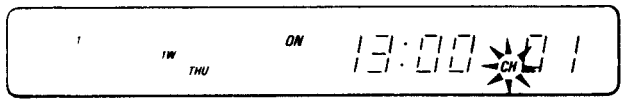
To record on a specified day at the same time each week:

First press the WEEKLY button. "1W" will disappear and "WLY" will appear in the display. Then select the day for recording by pressing the DAY (forward or reverse) button.
"1W" and "WLY" will appear alternately by pressing the WEEKLY button.



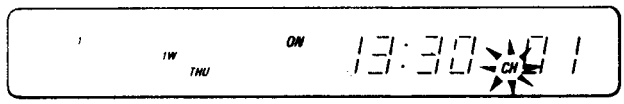
For example, above diagram shows recording on Thursday every week.

5. Select the hour for recording to start by pressing the HOUR buttons (forward or reverse). Hold down buttons to advance rapidly.



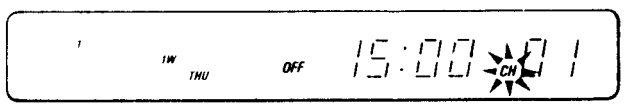
For example, the above diagram shows "13" hours has been set.

6. Select the minute for recording to start by pressing the MINUTE buttons (forward or reverse). Hold down buttons to advance rapidly.



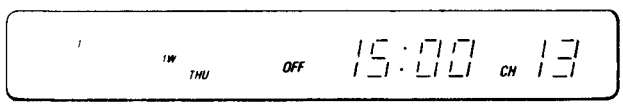
For example, the above diagram shows "30" minutes has been set.

7. Press the OFF button. "OFF" lights. Then set the stop time using the HOUR and MINUTE buttons. (Keep in mind that the maximum recording time without changing cassettes is 8 hours.)



For example, the above diagram shows the stop time "15:00" has been set.

8. Choose the channel to be recorded by pressing the CHANNEL up/down button. The channel number chosen is indicated, and letters "CH" will stop flashing.
   Note: Any channel to be recorded may be input by steps 4 through 8.



For example, the above diagram shows channel "13" has been set.

9. To set the next programme, repeat steps 2 through 8.
10. After programming return the MODE select switch to "NORMAL". The display will also return to the present time.
11. Turn on the TIMER button on the front panel of the tuner. The TIMER indicator will come on. If the indicator flashes, a cassette without its safety tab has been inserted. Replace it with a cassette with a tab. If the indicator will not light, the timer has not been programmed.

If a power failure occurs and the clock display flashes "SUN 0:00", programming information previously set is cleared. The programming information should be reset.

To correct programme errors

It is possible to correct the programme information when you find an error before returning the MODE select switch to "NORMAL". When the display indicates the stop time, stop time and channel for recording can be corrected. The start time and day for recording can be corrected when the start time is indicated. The start time and stop time indications are displayed alternately by pressing the ON/OFF buttons.

To clear a programme

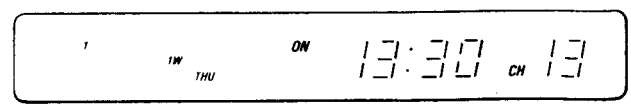
1. Set the MODE select switch to "PROGRAM".

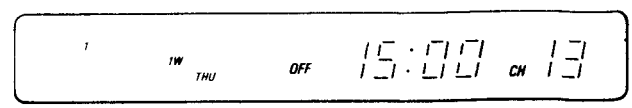
For example, the above diagram shows that programme numbers 1 through 3 have been programmed and programme numbers 4 through 7 have not been programmed.

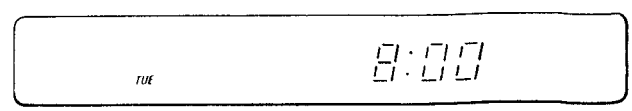
2. Press the PROGRAMME button until desired programme indicator lights.
   Then "ON" starts flashing.
3. Press the ON button.
   Then "0:00" will appear along with the day of the week, 1W, and the channel number with flashing "CH".
4. Then set the MODE select switch to "NORMAL".
   Now the programme is erased.

To check programming

1. Set the MODE select switch to "NORMAL".
2. Press the PROGRAMME button.
   The programme indicator "1" lights. If the programme No. 1 has been already programmed, the "ON" indicator lights and the clock/timer display shows the starting time. Then the "OFF" indicator lights and the display automatically shows the time to stop recording in a few seconds with the channel number to be recorded lighting up. The display then automatically returns to the present time of day.







Programming errors

If programmes overlap, the video deck will select the programme with the earliest start time. When that programme is over, the video deck will switch to the next programme. If the start times are the same, the video deck will select the programmes in numerical order.

DISMANTLING

VT-8E (TAPE DECK)

1. Main Mechanical Parts Locations

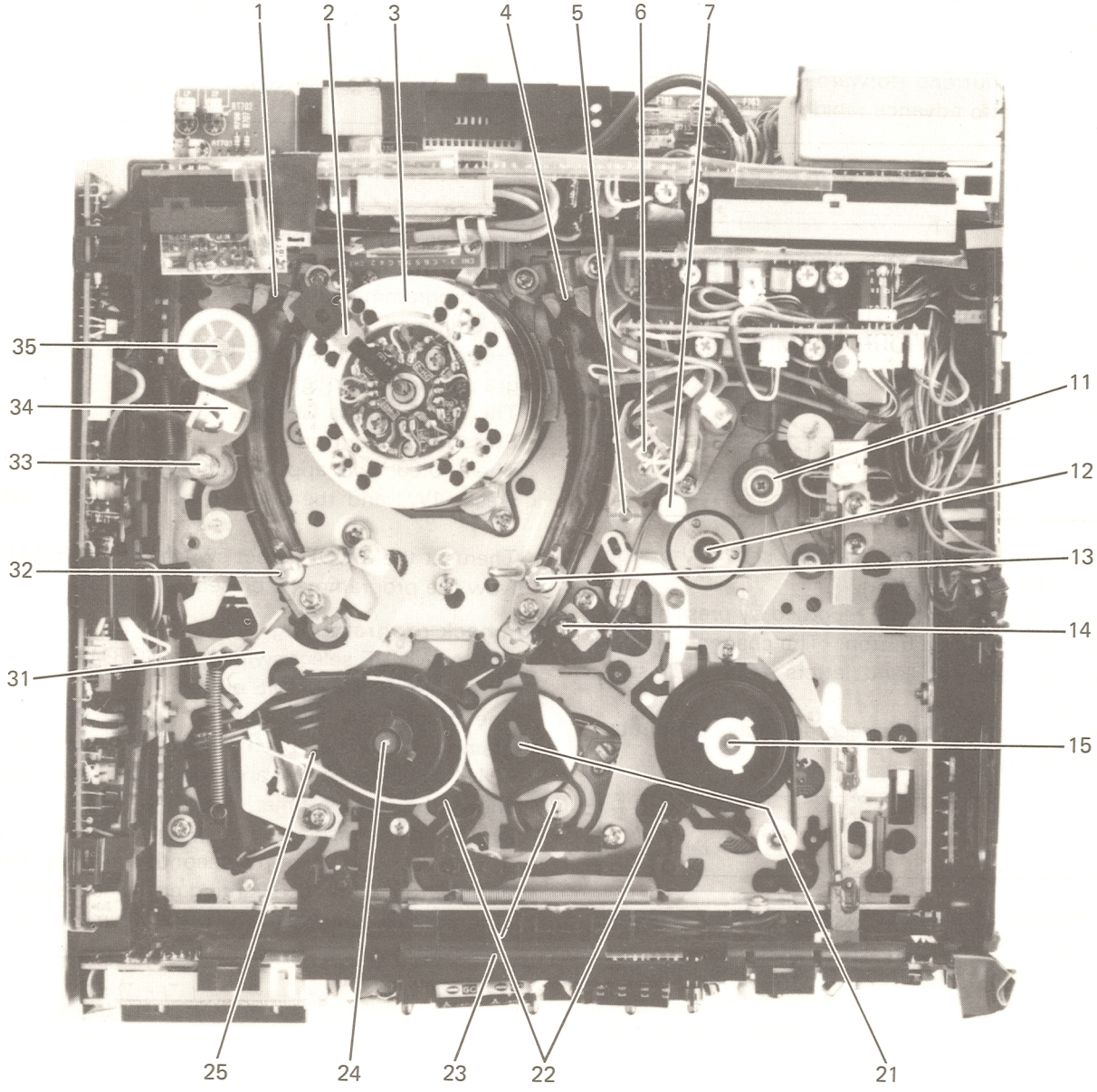


Fig. 1 Mechanism Top View of VT-8E

1. Catcher (supply side)
2. Ground piece of cylinder motor
3. Cylinder with five Video Heads (Video Head)
4. Catcher (take-up side)
5. X-value adjustment screw
6. Audio/Control head assembly
7. Guide pole (take-up side)

11. Pressure roller
12. Capstan shaft
13. Guide roller (take-up side)
14. End lamp
15. Take-up reel disk

21. Reel drive idler
22. Main brakes
23. Reel motor shaft
24. Supply reel disk
25. Tension band

31. Tension arm
32. Guide roller (supply side)
33. Guide pole (supply side)
34. Full erase head
35. Impedance roller

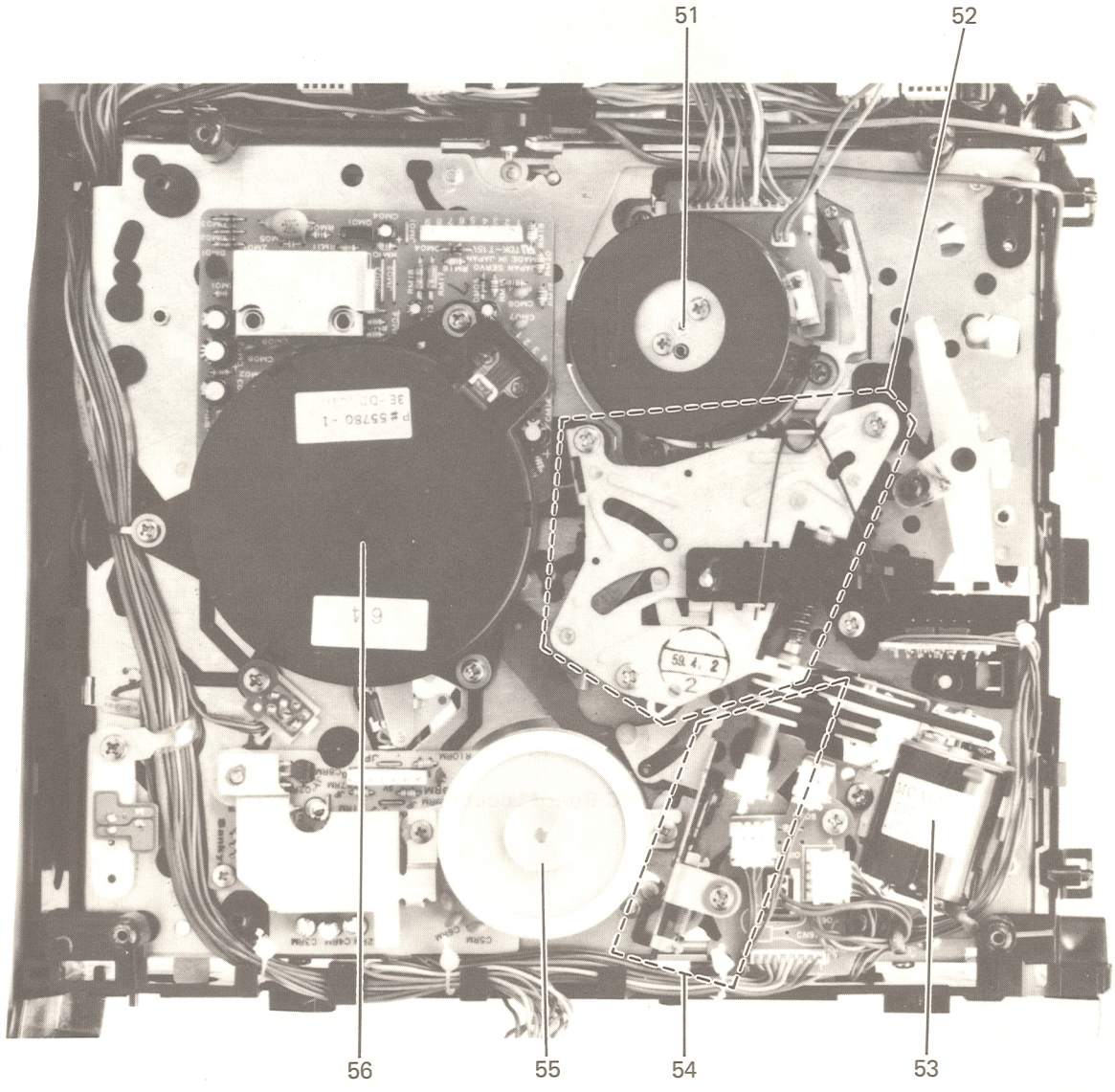


Fig. 2 Mechanism Bottom View of VT-8E

51. Cylinder motor
52. Loading mechanism assembly
53. Loading motor
54. Main brake operation mechanism
55. Reel motor
56. Capstan motor

2. PC Board Locations

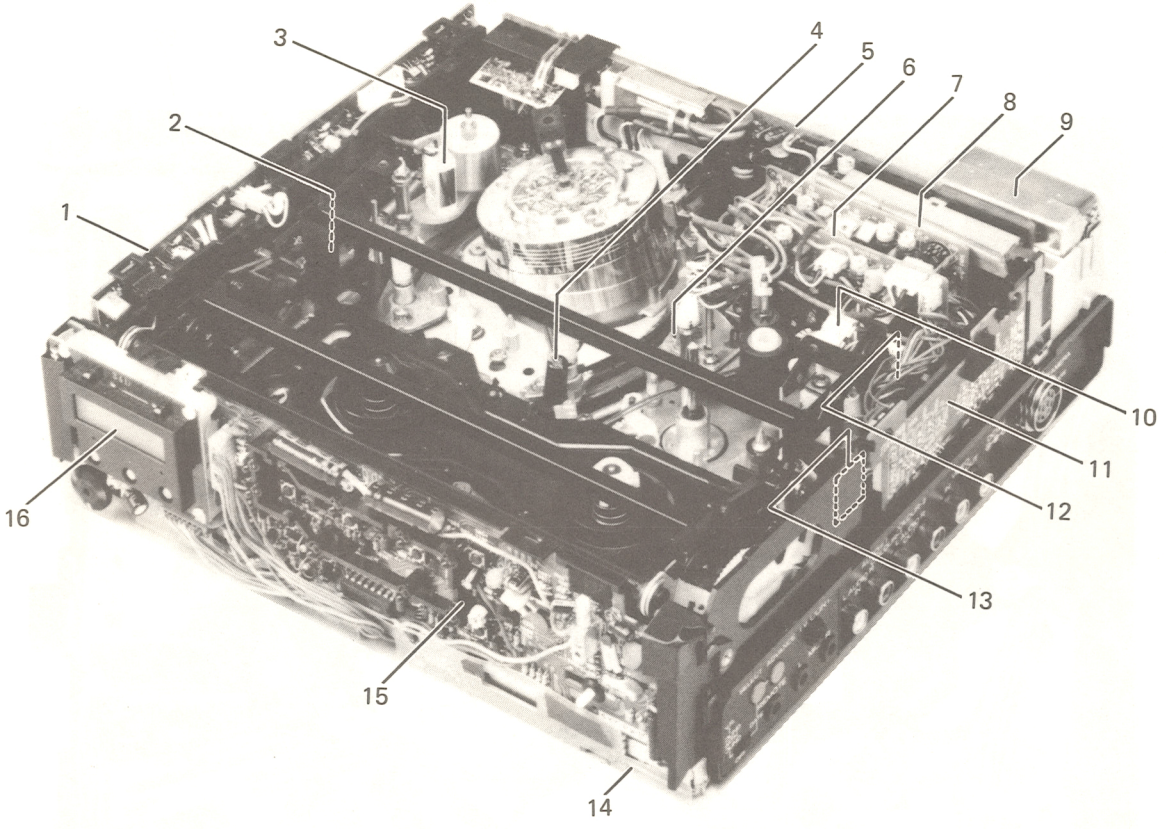
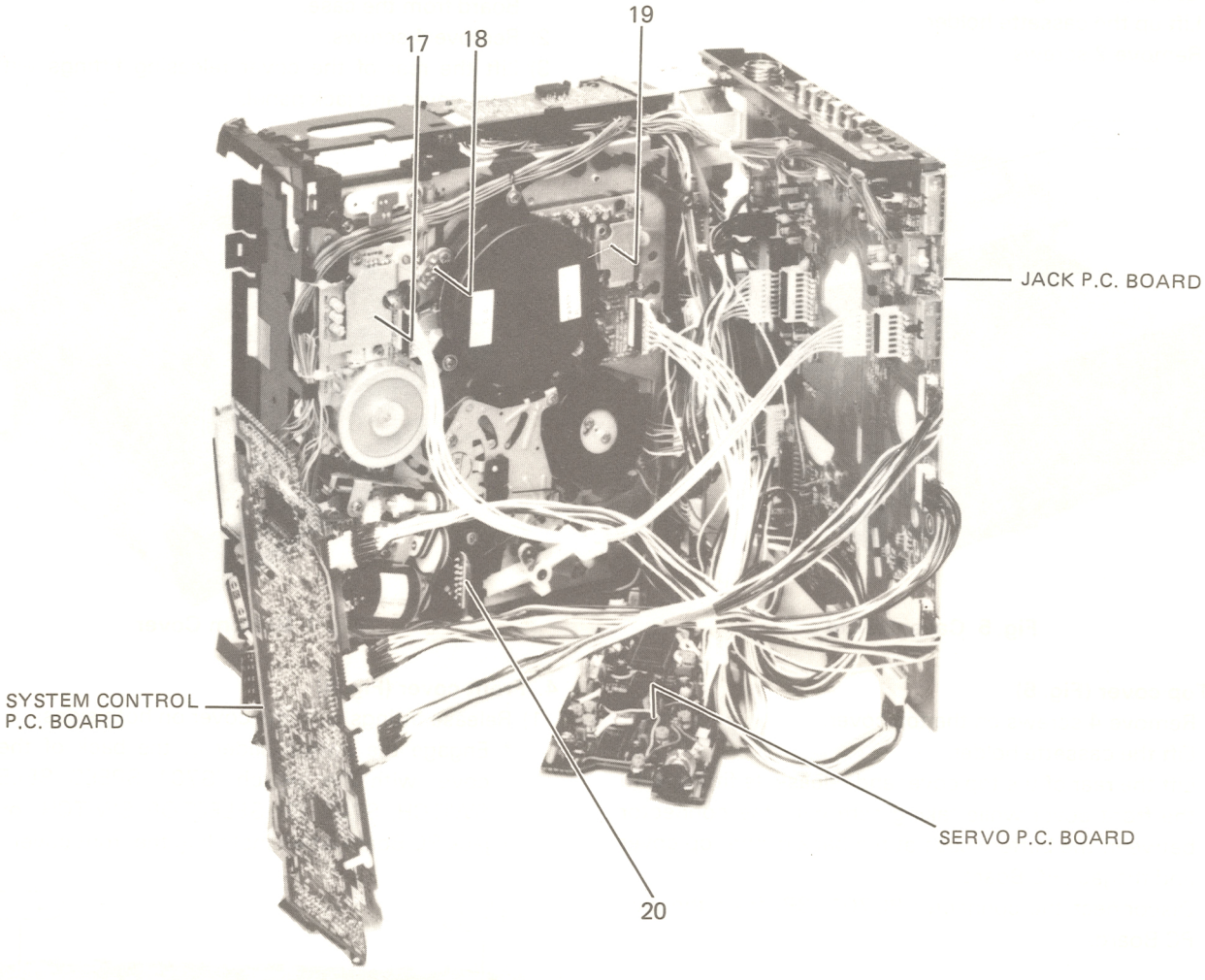


Fig. 3 PC Board Locations (I)

1. Servo PC Board
2. Supply end sensor
3. Full erase head
4. End lamp
5. Y/Chroma PC Board
6. A/C head
7. Audio (Rch) PC Board
8. Audio (Lch) PC Board
9. Switching regulator
10. Dew sensor
11. Wiring (III) PC Board
12. Loading Motor Drive PC Board
13. Take-up end sensor
14. Jack PC Board
15. System Control PC Board
16. Tape counter display



17. Reel Motor PC Board
18. Reel Sensor PC Board
19. Capstan Motor PC board
20. Mechanism State Switch

3. Removing the Case

1. Cassette lid (Fig. 5)

1) Lift up the cassette holder.
2) Remove 2 screws.

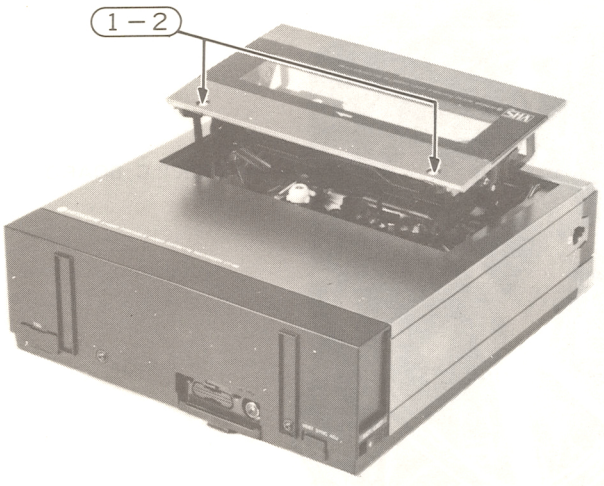


Fig. 5 Cassette Lid

2. Top cover (Fig. 6)

1) Remove 4 screws on the top cover.
2) Lift the cassette holder.
3) Lift the rear of the top cover and release its fitting with the front cover while taking care with the connector between the battery case at the back of the top cover and the jack PC Board.
4) Disconnect the connector PG701 (3P) from the jack PC Board.

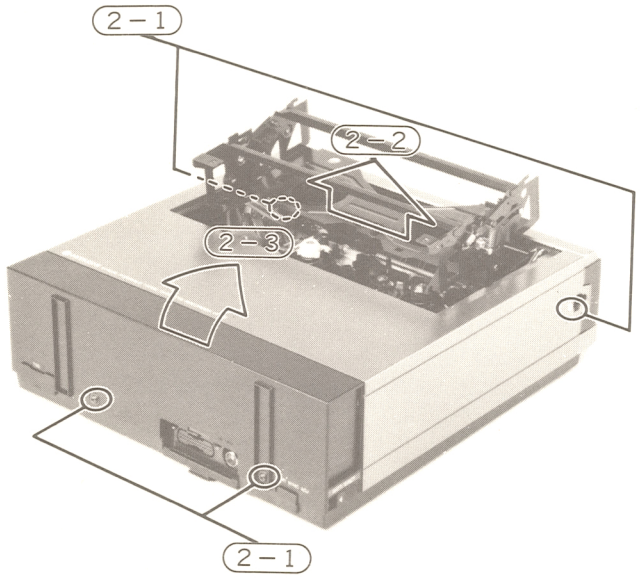


Fig. 6 Top Cover

3. Bottom cover (Fig. 7)

1) Remove the shield cover at the top of the servo PC Board from the case.
2) Remove 4 screws.
3) Lift the rear of the cover releasing fittings with the front cover and jack panel.

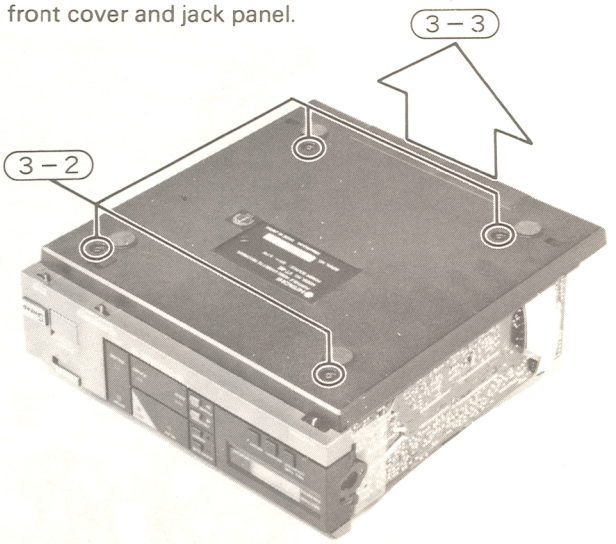


Fig. 7 Bottom Cover

4. Front cover (Fig. 8)

1) Release fittings with the cover on both sides.
   * Engage the switch slider at the back of the front cover with the switch (S701 SPEED SELECTOR SWITCH, S702 CH SELECTOR SWITCH) on the jack PC Board when installing the front cover.

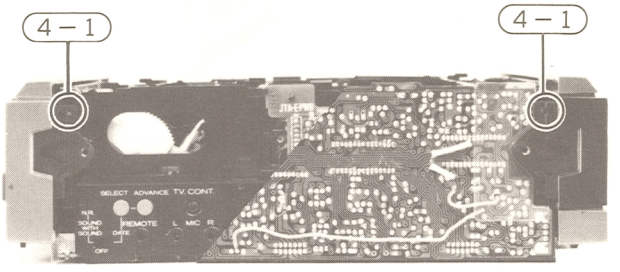


Fig. 8 Front Cover

5. Battery case (Fig. 9)

1) Remove the top cover.
2) Remove 3 tabs inside the top cover which fix the battery case.

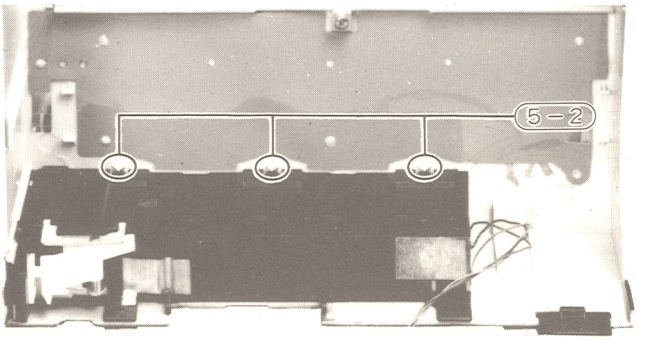


Fig. 9 Battery Case

4. Removing the PC Boards

PC Boards

1. System control PC Board
2. Servo PC Board
3. Y/Chroma PC Board
4. Audio PC Board
5. Wiring (III) PC Board
6. Switching regulator
7. Loading motor drive PC Board
8. Jack PC Board
9. Wiring (II) PC Board

1. System control PC Board (Fig. 10)

1) Release 2 tabs at the top of the PC Board.
2) Pull the bottom of the PC Board toward front and disconnect the 3 relay plugs (PG801, PG802, PG803) from the jack PC Board.
3) Disconnect connectors PG804 (8P) and PG805 (8P).

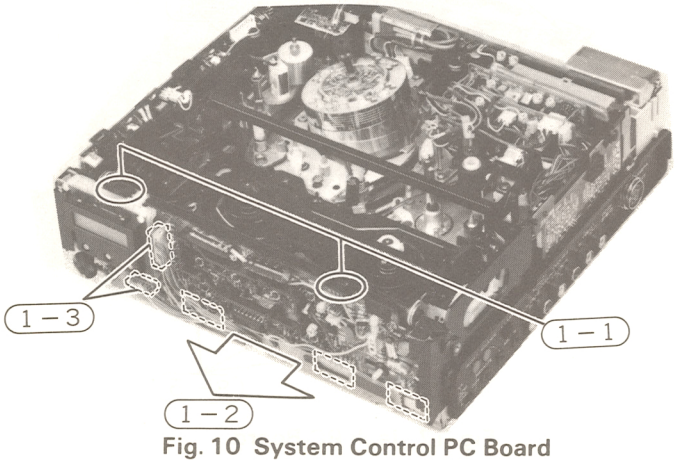


Fig. 10 System Control PC Board

2. Servo PC Board (Fig. 11)

1) Disconnect the connector PG501 (2P).
2) Release 2 fitting sections at the top of the PC Board.
3) Pull bottom of the PC Board toward front and remove the 3 relay plugs (PG502, PG503, PG504) from the jack PC Board.

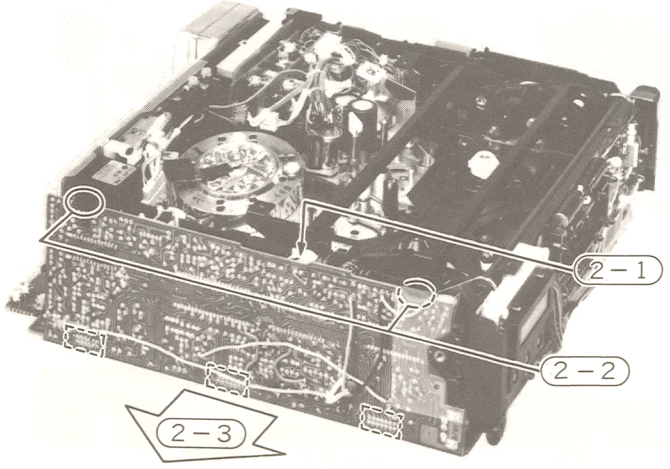


Fig. 11 Servo PC Board

3. Y/Chroma PC Board (Fig. 12)

1) Disconnect the connector PG203 (12P) from the video head PC Board.
2) Release 1 tab at the top of the PC Board.
3) Lift the PC Board and remove 2 relay connectors (CN201, CN202) from the jack PC Board.

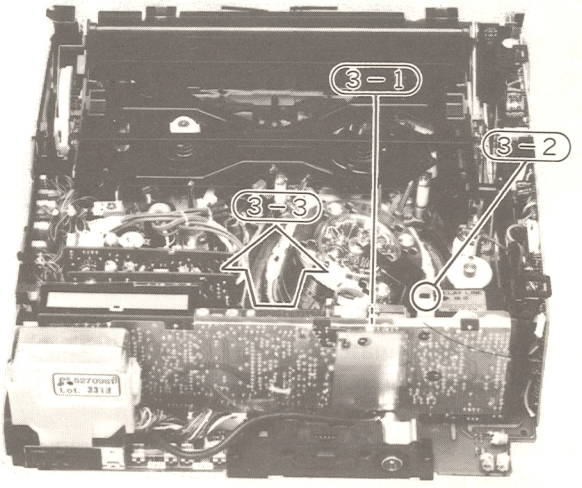


Fig. 12 Y/Chroma PC Board

4. Audio PC Boards (Fig. 13)

1) Disconnect connectors PG403 (3P), PG404 (2P), PG406 (3P), PG407 (4P) from the audio (Rch) PC Board and PG401 (3P), PG402 (2P), PG405 (8P) from the audio (Lch) PC Board.
2) Pull out both PC Boards simultaneously while taking care with the relay cord between the audio PC Board.

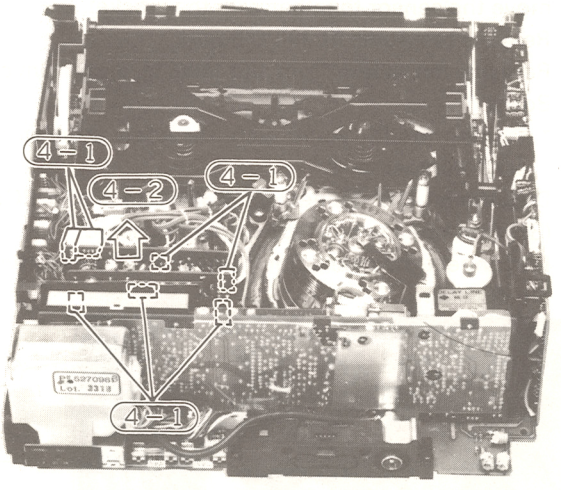


Fig. 13 Audio PC Board

5. Wiring (III) PC Board (Fig. 14)

1) Release 2 tabs at the top of the circuit board.
2) Disconnect connectors PG902 (3P), PG904 (2P), PG905 (2P), PG906 (2P), PG907 (2P), PG408 (4P) and PG409 (2P) from the PC Board.

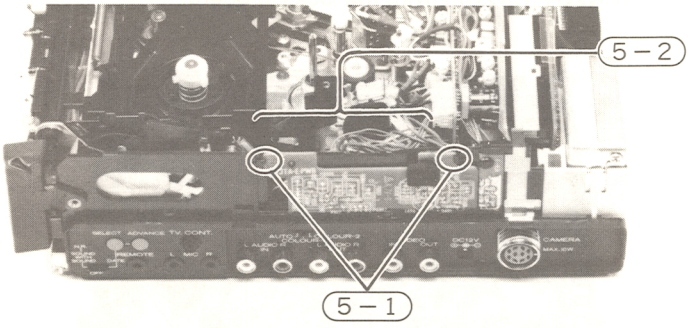


Fig. 14 Wiring III PC Board

6. Switching regulator (Fig. 15)

1) Disconnect the connector PG702 (12P) from the jack PC Board.
2) Release tab and remove the switching regulator by pulling upward.

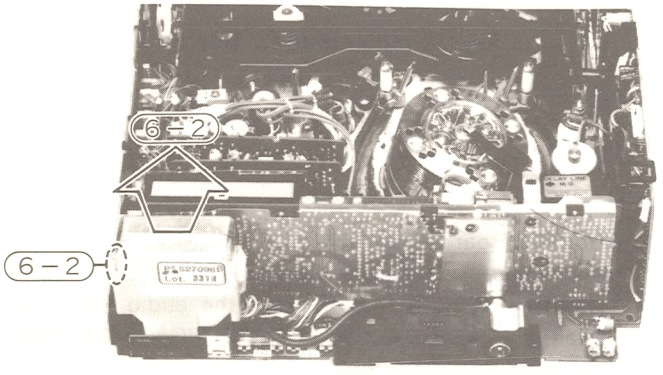


Fig. 15 Switching Regulator

7. Loading motor drive PC Board (Fig. 16)

1) Remove the dew sensor bracket fixing screw and remove the sensor together with the bracket.
2) Remove the Audio (Rch) PC Board.
3) Remove the screw from the loading motor drive PC Board.
   * Tighten the PC Board with the screw attaching the cord clamper to it.
4) Disconnect the connectors PG901 (4P) and PG903 (3P) from the loading motor drive PC board.
5) Disconnect the connector PG902 (3P) from the wiring (III) PC Board.

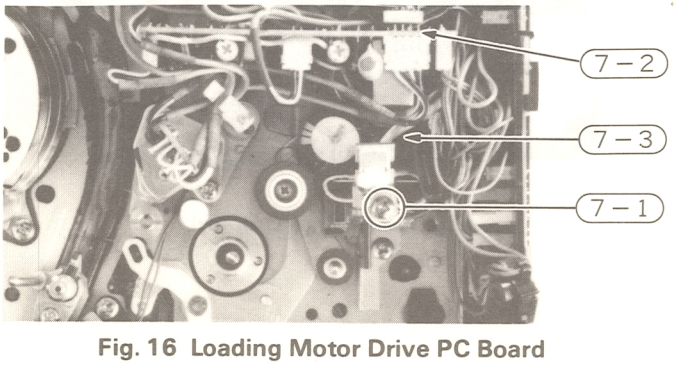


Fig. 16 Loading Motor Drive PC Board

8. Jack PC Board (Fig. 17)

1) Remove the system control PC Board while referring to the "System control PC Board removal".
2) Remove the servo PC Board while referring to the "Servo PC Board removal".
3) Remove the Y/Chroma PC Board while referring to the "Y/Chroma PC Board removal".
4) Disconnect the connector PG702 (12P) from the jack PC Board and pull out the switching regulator together with the bracket.
5) Remove screw and release 4 fitting sections with the case.
6) Lift the whole PC Board and remove 2 relay connectors (CN706, CN707) between the reel motor and capstan motor PC Boards.

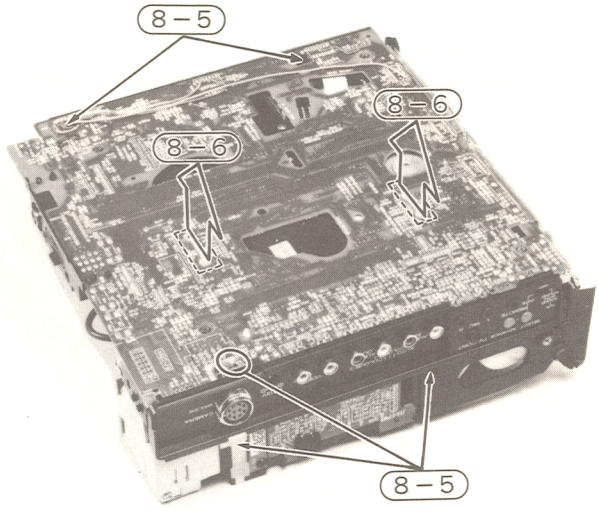


Fig. 17 Jack PC Board

9. Wiring (II) PC Board (Fig. 18)

1) Remove the jack PC Board while referring to the "Jack PC Board removal".
2) Disconnect the connector PG912 (2P) from the safety tab switch.
3) Disconnect connectors PG909 (4P), PG910 (3P) and PG911 (2P).
4) Remove the screw from the wiring (II) PC Board.

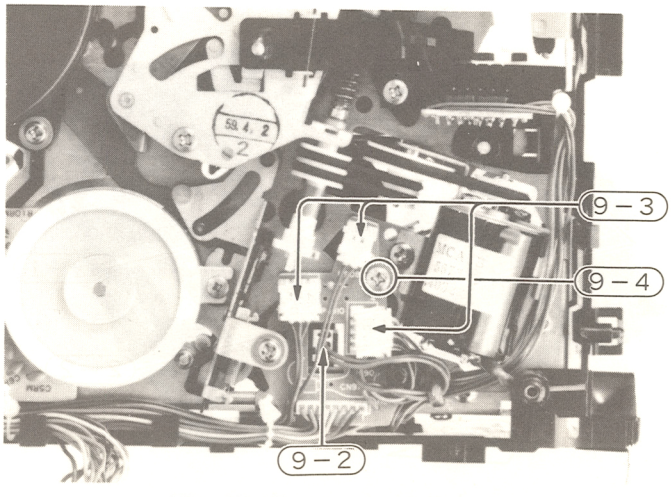


Fig. 18 Wiring (II) PC Board

4. Audio/control head (A/C Head) (Figs. 21, 22)

1) Remove 2 bead bands.
2) Remove the A/C head base fixing nut and washer to pull out the A/C head assembly.
3) Disconnect connector PG401 (3P) from the audio (Lch) PC Board and PG403 (3P), PG407 (4P) from the audio (Rch) PC Board.
   * Install the A/C head according to the reverse procedure to the above. Hook the bottom of the spring under the A/C head base to the stopper of the chassis, and the top, to the tab of the base. Check that the tip of the head base fixing screw is approx. 3 — 4 mm above the base top and adjust as follows after installing the A/C head assembly.
   - ○ AC Head Height Adjustment
   - ○ AC Head Azimuth Adjustment
   - ○ AC Head Tilt Adjustment
   - ○ AC Head Position Adjustment

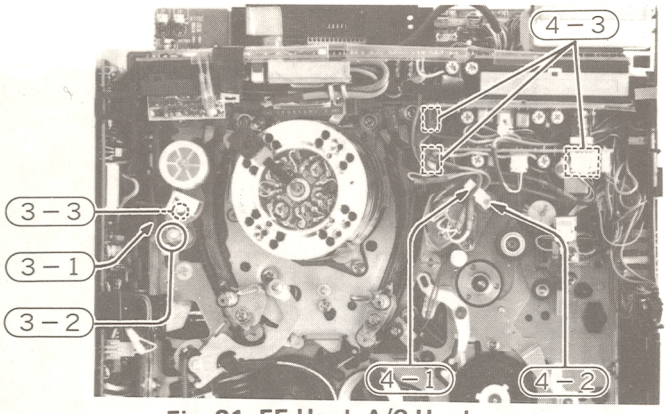


Fig. 21 FE Head, A/C Head

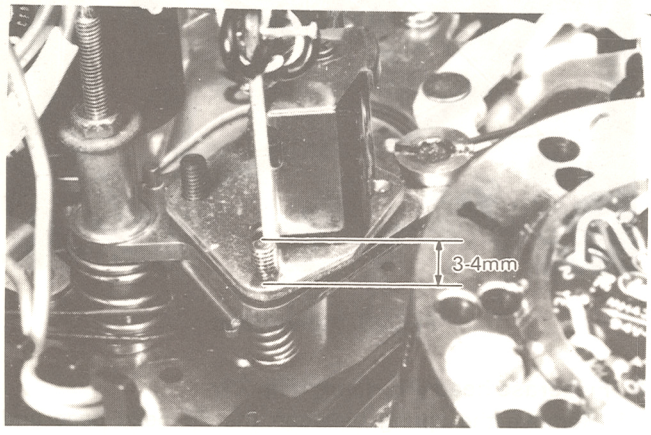


Fig. 22 A/C Head

5. Cassette holder switch (Fig. 23)

1) Remove the jack PC Board while referring to "Jack PC Board removal".
2) Remove the cassette holder switch fixing screw.
3) Disconnect the connector PG911 (2P) from the wiring (II) PC Board.
   * Install the cassette holder switch after lifting the cassette holder.
   Screw the holder switch while attaching the cord clamper to it.

6. Mechanism state switch (Fig. 23)

1) Remove the jack PC Board while referring to the "Jack PC Board removal".
2) Remove the mechanism state switch fixing screw, lift the screw hole side and release its fitting with the chassis.
   * Fix the mechanism state switch with the screw after matching the switch lever with the slider groove when installing the switch.
   Adjust the mechanism state switch after installing it.
3) Disconnect the connector PG909 (4P) from the wiring (II) PC Board.

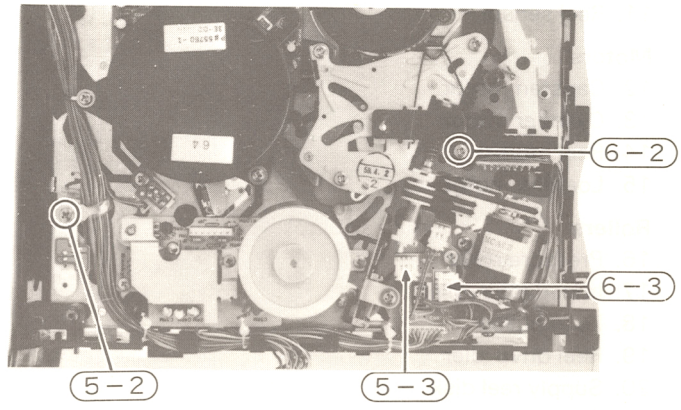
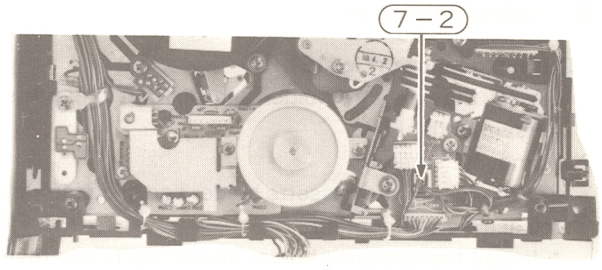


Fig. 23 Switches

7. Safety tab switch (Fig. 24)

1) Remove the jack PC Board while referring to the "Jack PC Board removal".
2) Disconnect the connector PG912 (2P) from the safety tab switch.
3) Remove the cassette holder while referring to the "Cassette holder removal".
4) Remove the safety tab fixing screw.

(VOTTOM VIEW)



(TOP VIEW)

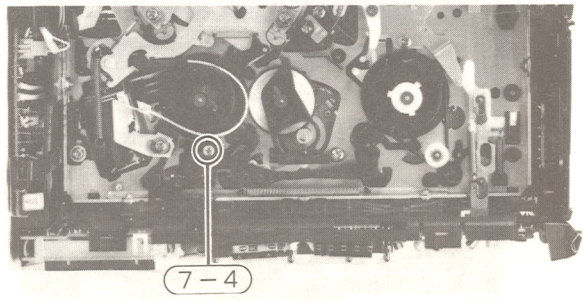


Fig. 24 Safety Tab Switch

5. Removing the Main Electric Parts and Main Mechanical Parts

1. Cassette holder

Heads and Sensors

2. Video head (Upper Cylinder)
3. Full erase head
4. Audio/control head
5. Cassette holder switch
6. Mechanism state switch
7. Safety tab switch
8. Supply and take-up end sensors
9. End lamp
10. Dew sensor
11. Reel sensor

Motors

12. Capstan motor
13. Cylinder motor
14. Reel motor
15. Loading motor

Rollers

16. Pressure roller
17. Impedance roller
18. Load pulley
19. Reel drive idler
20. Supply reel disk
21. Take-up reel disk

Pole and brakes

22. Supply and take-up main brakes
23. Supply sub brake
24. Tension band and tension arm
25. Supply guide pole
26. Take-up guide pole
27. Guide rollers
28. Supply and take-up inclined guides
29. Eject slider and eject hold arm
30. Brake slider
31. Supply and take-up loading arms
32. Loading gear assembly

1. Cassette holder (Fig. 19)

1) Lift up the cassette holder and pull out the end sensors on both sides.
2) Remove 2 screws.
3) Lift the rear of the cassette holder and slide forward to release front mounting.
   * Install the cassette holder according to the reverse procedure to the above.

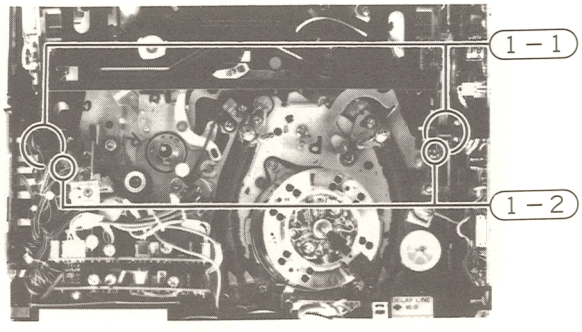


Fig. 19 Cassette Holder

2. Video head (Upper Cylinder) (Fig. 20)

1) Remove the brush fixing screw to remove the ground piece brush.
2) Remove 10 leads of the video head.
3) Remove 2 video head fixing screws to pull out the video head.
   * Be careful during work not to touch the video head tips with your fingers or tools.
   Install the video head according to the reverse procedure to the above.
   Tighten 2 video head fixing screws alternately.
   Perform adjustments shown below after installing the video head.
   - ○ Head Switching point Adjustment (CH-1, CH-2 Phase)
   - ○ Tracking Preset Adjustment
   - ○ Record Y and Chroma Level Adjustments

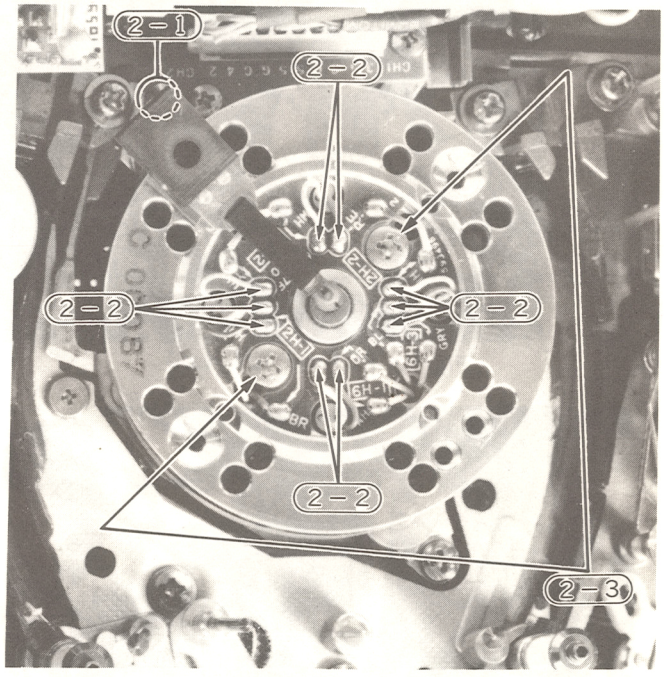


Fig. 20 Video Head

3. Full erase head (FE Head) (Fig. 21)

1) Remove the spring between the FE head base and chassis.
2) Remove the guide pole fixing nut and pull out the guide pole, spring and washer.
3) Pull out the FE head base and then remove the FE head fixing screw at the back of the base.
   * Install the FE head according to the reverse procedure to the above.

14. Reel motor (Fig. 29)

1) Remove the reel drive idler while referring to "Reel drive idler removal".
2) Remove the jack PC Board while referring to "Jack PC Board removal".
3) Remove 3 screws.

15. Loading motor (Fig. 29)

1) Remove the jack PC Board while referring to the "Jack PC Board removal".
2) Remove the loading motor fixing screw.
3) Remove 2 loading belts.
   * Fix the motor with screws after matching the groove on the chassis and the stopper on the motor bracket when installing the loading motor.

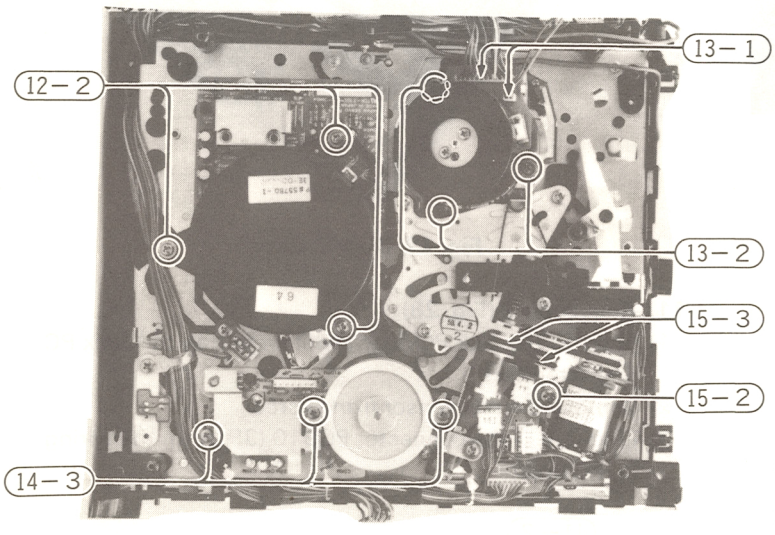


Fig. 29 Motors

16. Pressure roller (Fig. 30)

1) Remove the pressure roller fixing screw.
   * Install the pressure roller so that the side with the inside of the pressure roller made from plastic is set to the top.

17. Impedance roller (Fig. 30)

1) Remove the spring between the FE head base and chassis.
2) Remove the guide pole fixing nut and pull out the guide pole, spring and washer.
3) Pull out the FE head base and remove the FE head fixing screw at the back of the base to remove the FE head.
   * Impedance roller is fixed to the FE head base together with the roller shaft and roller.
   Install the impedance roller according to the reverse procedure to the above.

18. Load pulley (Fig. 30)

1) Remove the cassette holder while referring to the "Cassette holder removal".
2) Remove the belt between the load pulley and the reel disk.
3) Remove the washer at the top of the load pulley.

19. Reel drive idler (Fig. 30)

1) Remove the cassette holder while referring to the "Cassette holder removal".
2) Remove the Fix screw from the reel motor shaft.
3) Remove the reel drive idler fixing screw.
   * Confirm that the reel motor shaft does not rattle up/down after installing the reel drive idler.
   If it rattles, tighten the hexagonal screw while pressing the reel motor flywheel from the jack PC Board side.

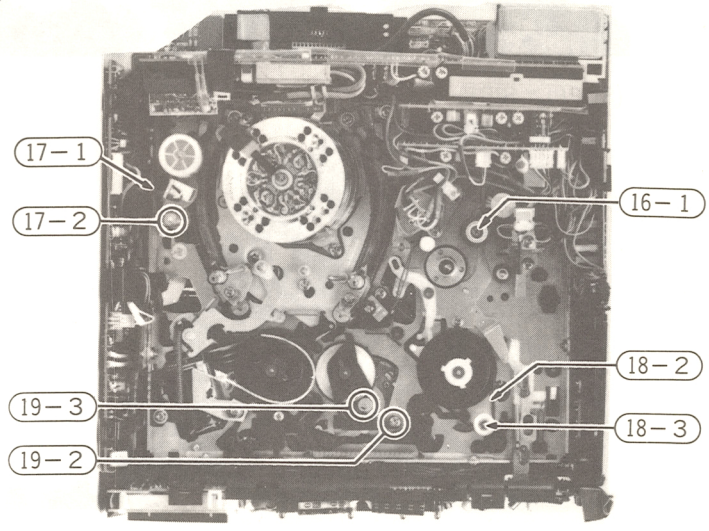


Fig. 30 Rollers

20. Supply reel disk (Fig. 31)

1) Remove the cassette holder while referring to the "Cassette holder removal".
2) Remove the tension arm and tension band while referring to the "Tesion band and Tension arm removal".
3) Remove the supply sub-brake while referring to the "Supply sub-brake removal".
4) Remove the washer at the top of the reel disk.
   * Install the supply reel disk according to the reverse procedure to the above.
   The bearing and washer are inserted between the reel disk and chassis. Install the supply reel disk after checking these.

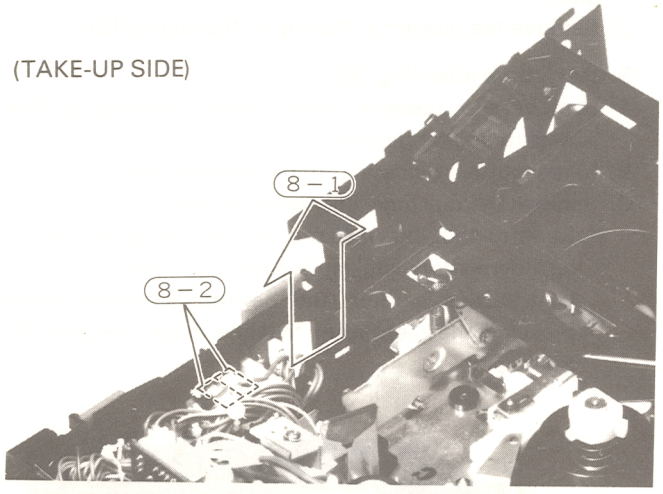
21. Take-up reel disk (Fig. 31)

1) Remove the cassette holder while referring to the "Cassette holder removal".
2) Remove the belt between the reel disk and the load pulley.
3) Remove the washer at the top of the reel disk.
   * The washer is inserted between the reel disk and chassis. Install the take-up reel disk after checking it.

8. Supply and take-up end sensors (Fig. 25)

1) Lift the cassette holder and pull the sensors upward to remove.
2) Disconnect the connectors PG904 (2P) and PG905 (2P) from the wiring (III) PC Board.

(TAKE-UP SIDE)



(SUPPLY SIDE)

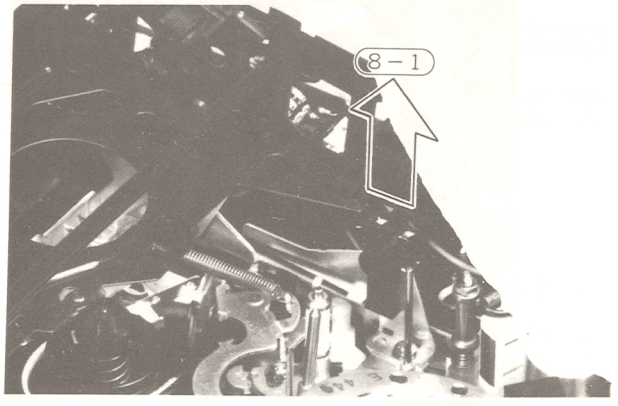


Fig. 25 End Sensors

9. End lamp (Fig. 26)

1) Remove the end lamp fixing screw.
2) Disconnect the connector PG907 (2P) from the wiring (III) PC Board.

Note: When replacing, be sure to route wires through the wire guides.

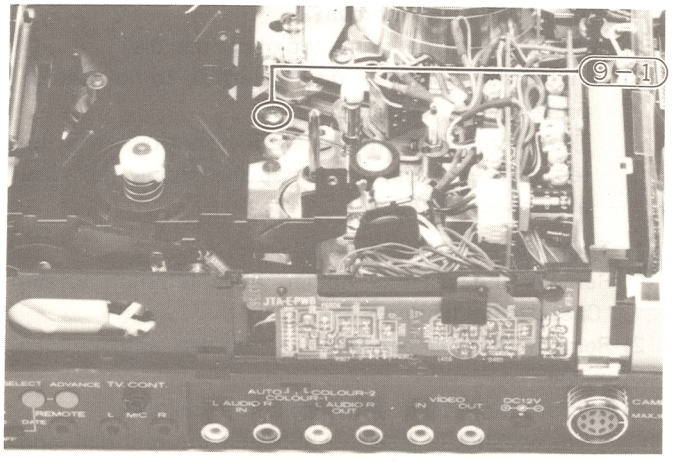


Fig. 26 End Lamp

10. Dew Sensor (Fig. 27)

1) Remove the dew sensor fixing screw.
2) Disconnect the connector PG906 (2P) from the wiring (III) PC Board.

Note: Don't touch the dew sensor surface.

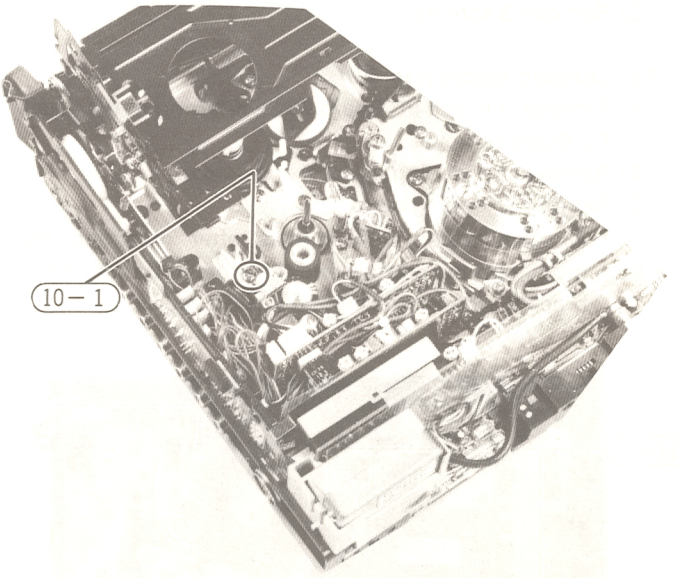


Fig. 27 Dew Sensor

11. Reel sensor (Fig. 28)

1) Remove the jack PC Board while referring to "Jack PC Board removal".
2) Remove the reel sensor fixing screw.
3) Disconnect the connector PG910 (3P) from the wiring (II) PC Board.

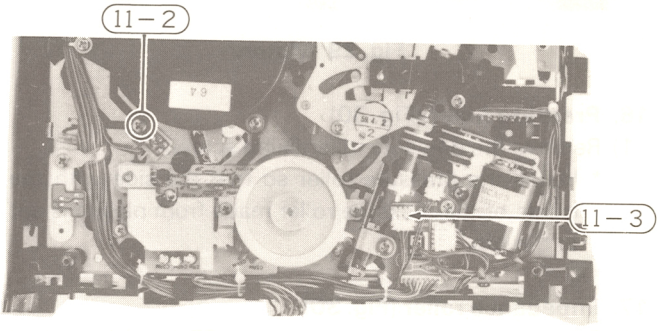


Fig. 28 Reel Sensor

12. Capstan motor (Fig. 29)

1) Remove the jack PC Board while referring to "Jack PC Board removal".
2) Remove 3 screws.
   * The insulator is inserted between the capstan motor and the chassis.
   Apply the insulator to the cpastan motor and fix the motor when installing it.

13. Cylinder motor (Fig. 29)

1) Remove the jack PC Board while referring to "Jack PC Board removal" and disconnect 2 connectors PG781 (13P), PG782 (2P) from the jack PC Board.
2) Remove 3 screws.

22. Supply and take-up main brakes (Fig. 31)

1) Remove the cassette holder while referring to the "Cassette holder removal".
2) Remove the spring between the supply and take-up main brakes.
3) Release fitting with the chassis.

23. Supply sub brake (Fig. 31)

1) Remove the cassette holder while referring to the "Cassette holder removal".
2) Remove the spring between the sub-chassis and brake.
3) Release fitting of the brake rotary shaft.

24. Tension band and tension arm (Fig. 31)

1) Remove the cassette holder while referring to the "Cassette holder removal".
2) Remove the spring between the tension arm and spring holder.
3) Remove the tension band fixing screw.
4) Release fitting of the tension arm and pull out the tension arm and tension band.
   * Install the tension band and tension arm according to the reverse procedure to the above.
   Perform adjustments below after installing them.
   ○ Tension Arm Position Adjustment
   ○ Back Tension Adjustment

25. Supply guide pole (Fig. 31)

1) Remove the guide pole fixing nut.
   * Adjust the height of the guide pole after installing it.

26. Take-up guide pole (Fig. 31)

1) Remove the guide pole fixing nut.
   * Adjust the height of the guide pole after installing it.

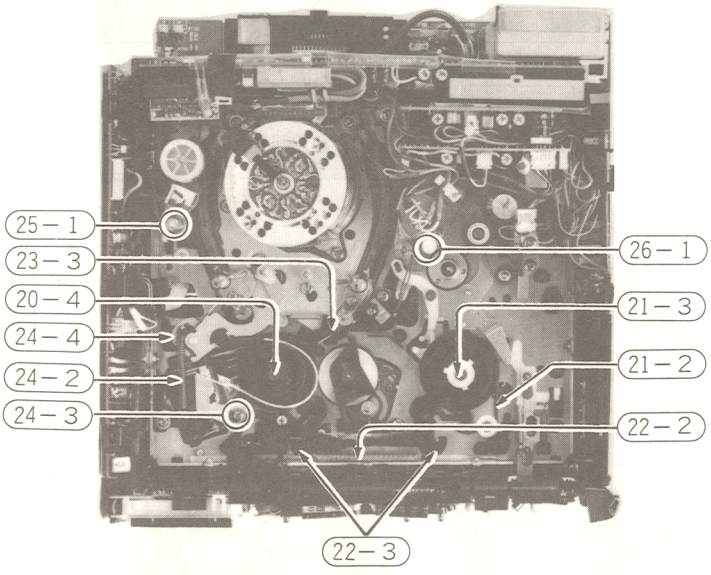


Fig. 31

27. Guide roller (Fig. 32)

1) Lift up the cassette holder.
2) Loosen the guide roller fixing screws.
3) Turn the guide rollers to remove.
   * Adjust the guide rollers after installation.

28. Supply and take-up inclined guides (Fig. 32)

1) Lift up the cassette holder.
2) Remove the guide roller fixing screws.
3) Remove the inclined guide fixing screws.
   * Adjust the inclined guides after installing them.

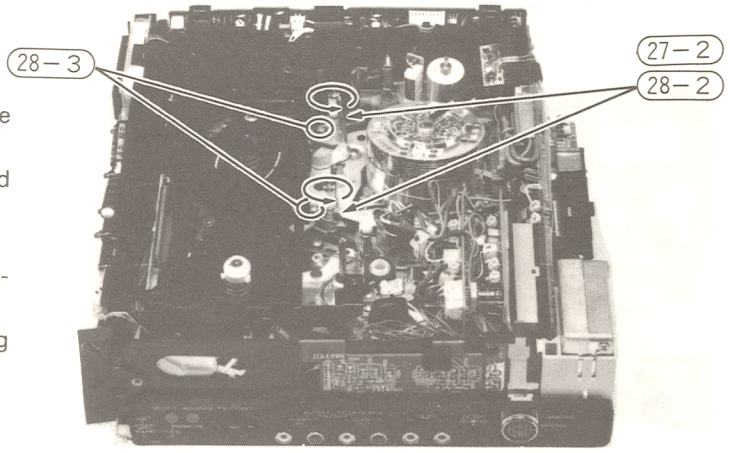


Fig. 32 Guide Roller, Supply and Take-up Inclined Guides

29. Eject slider and eject hold arm (Fig. 33)

1) Remove the cassette holder while referring to the "Cassette holder removal".
2) Remove 2 springs between the slider and hold arm, and slider and chassis.
3) Remove 2 washers which fix the eject slider.

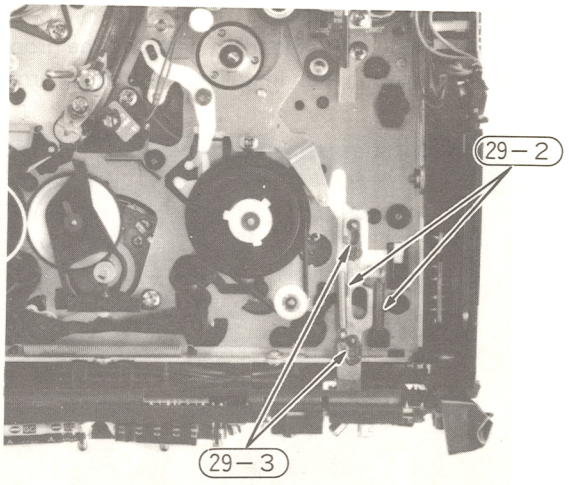


Fig. 33 Eject Slider and Eject hold Arm

30. Brake slider (Fig. 34)

1) Remove the cassette holder while referring to the "Cassette holder removal".
2) Remove the reel drive idler while referring to the "Reel drive idler removal".
3) Remove the jack PC Board while referring to the "Jack PC Board removal".
4) Remove the reel motor while referring to the "Reel motor removal".
5) Remove the brake slider fixing screw.
   * Insert the brake/pressure roller operation arm pin into the groove in the slider driving section when installing the brake slider.

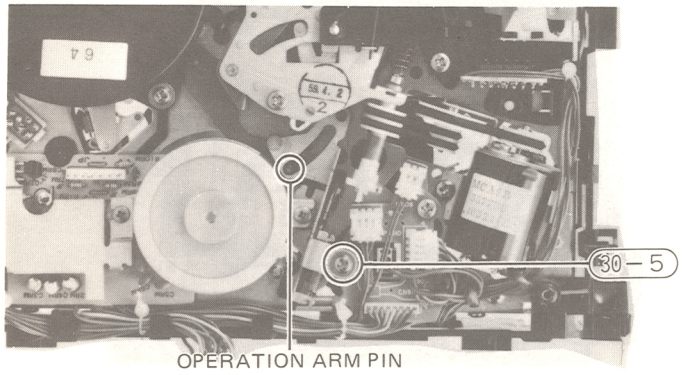


Fig. 34 Brake Slider

31. Supply and take-up loading arms (Fig. 35)

1) Remove the cassette holder while referring to the "Cassette holder removal".
2) Remove the tension band and tension arm while referring to the "Tension band andTension arm removal".
3) Remove the supply sub brake while referring to the "Supply sub brake removal".
4) Remove 3 sub-chassis fixing screws and then remove the sub-chassis, guide pole and inclined guide together with their bases.
   * Install the loading arm according to the reverse procedure to the above.
   Fit the stopper of the loading gear and the groove in the loading arm when installing the loading arm.

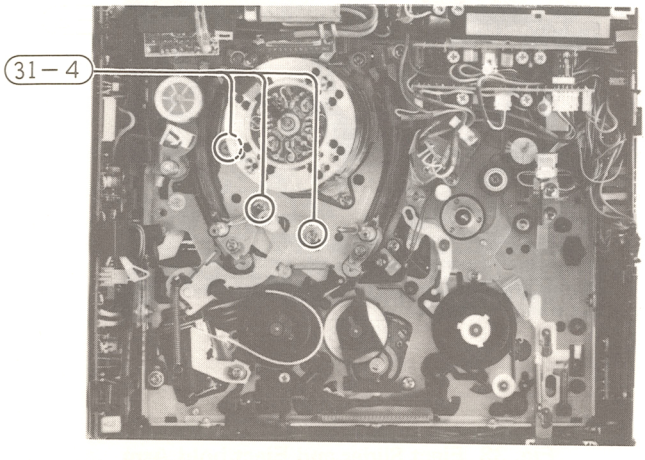
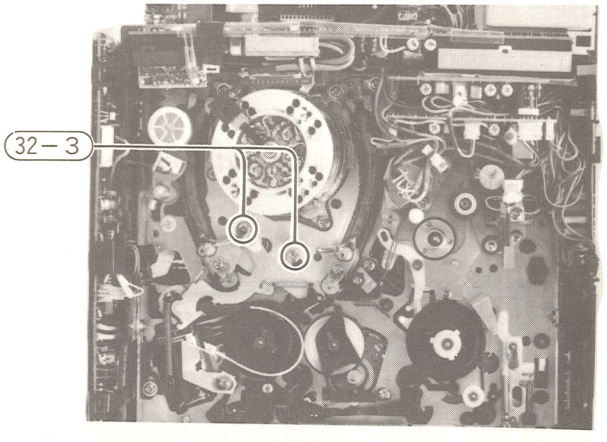


Fig. 35 Supply and Take-up Loading Arms

32. Loading gear assembly (Fig. 36)

1) Remove the cassette holder while referring to the "Cassette holder removal".
2) Remove the reel drive idler while referring to the "Reel drive idler removal".
3) Remove 2 screws on the sub chassis.
4) Remove the jack PC Board while referring to the "Jack PC Board removal".
5) Remove the capstan motor while referring to the "Capstan motor removal".
6) Remove the reel motor while referring to the "Reel motor removal".
7) Remove the brake slider while referring to the "Brake slider removal".
8) Remove the mechanism state switch while referring to the "Mechanism state switch removal".
9) Remove the spring from the loading gear assembly.
10) Release the fitting with the loading gear assembly to remove the switch slider.
11) Release the fitting between the tension release arm and the chassis to remove the tension release arm.
12) Remove 2 loading belts.
13) Remove 3 loading gear assembly fixing screws.
   * Install the loading gear assembly in the reverse procedure while paying attention to the following.
     ○ Insert the take-up brake drive arm pin into the hole in the take-up brake operation arm.
     ○ Insert the pressure roller drive arm pin into the hole in the pressure roller operation arm.



(BOTTOM VIEW)

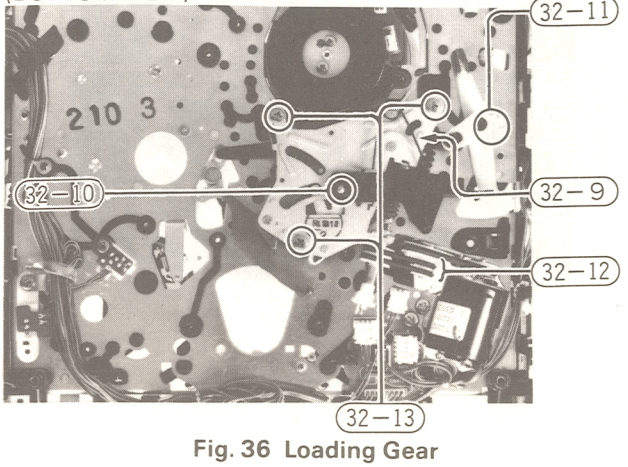


Fig. 36 Loading Gear

3. Removing the PC Boards

1. Timer/Input key PC Board (Fig. 41)

1) Disconnect 2 connector CN111 (6P), CN112 (5P), CN113 (4P), CN103 (4P).
2) Remove 2 screws on the PC Board.

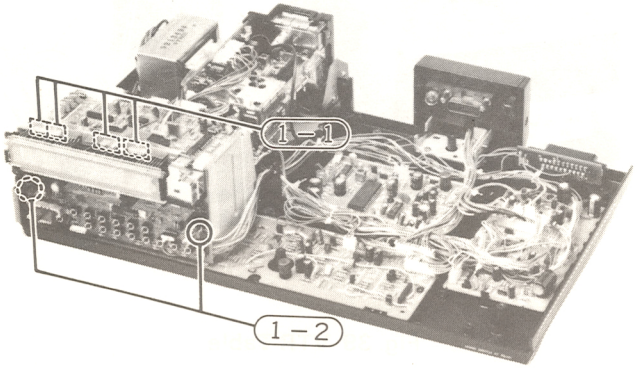


Fig. 41 Timer/Input Key PC Board

2. V·S Tuning PC Board (Fig. 42)

1) Disconnect connectors PG701 (9P), PG702 (6P), PG711 (6P), PG712 (5P), PG801 (9P) and CN722 (4P), CN723 (4P).
2) Release 2 tabs which fix the V·S Tuning PC Board.

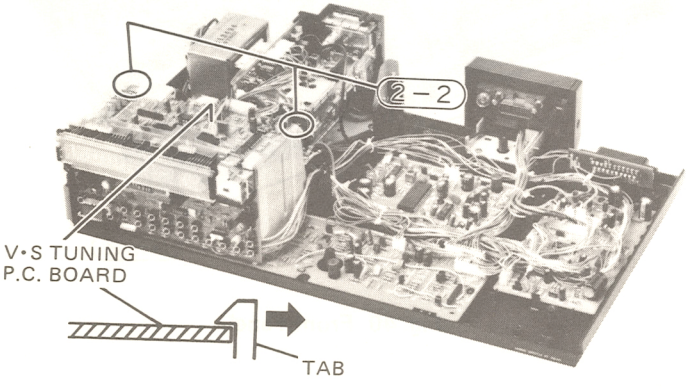
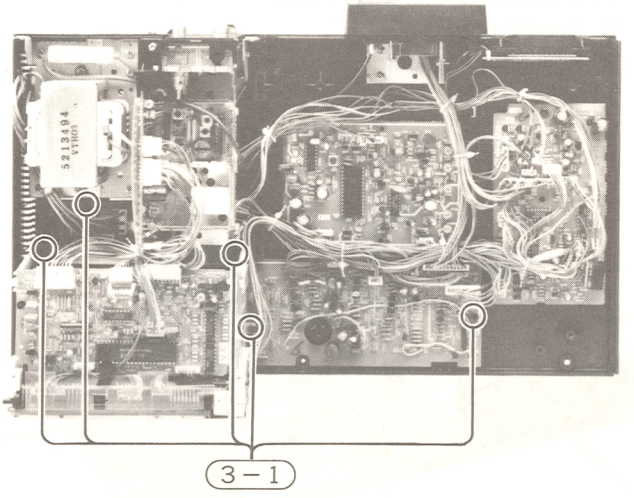


Fig. 42 V·S Tuning PC Board

3. Regulator PC Board (Fig. 43)

1) Remove 5 screws which fix the PC Board holder.
2) Lift the PC Board holder and remove 2 screws which fix the regulator PC Board.
3) Disconnect the connectors PG904 (10P), PG905 (6P), from the PC Board.
4) Disconnect connectors PG906 (4P), PG907 (3P), PG908 (5P), PG909 (12P), PG911 (9P) and CN910 (6P).



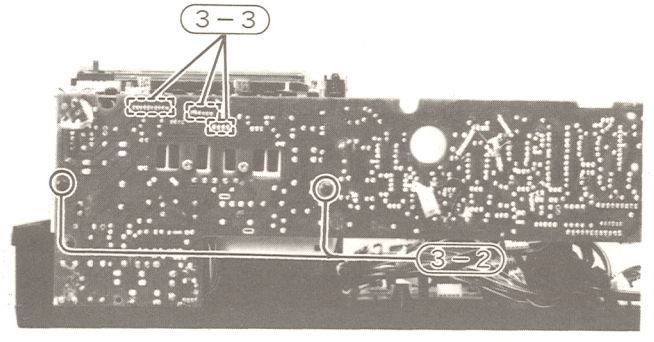


Fig. 43 Regulator PC Board

4. MPX·Demod. PC Board (Fig. 44)

1) Remove 1 screw on the PC Board.
2) Release 2 tabs which fix the MPX·Demod. PC Board.
3) Disconnect connectors PG801 (4P), PG802 (4P), PG803 (3P).

5. Sub PC Board (Fig. 44)

1) Remove 2 screws on the PC Board.
2) Release 1 tab which fix the sub PC Board.

Peri Connector PC Board (Fig. 44)

3) Pull up the peri connector PC Board.

VT-TU8E (TUNER/TIMER)

1. PC Board Loactions

1. Timer/Input key PC Board
2. V·S Tuning PC Board
3. Tuner/IF PC Board
4. IF/Pack
5. Tuner connector
6. Peri Connector PC Board
7. MPX Demodulator PC Board
8. Sub PC Board
9. Regulator PC Board

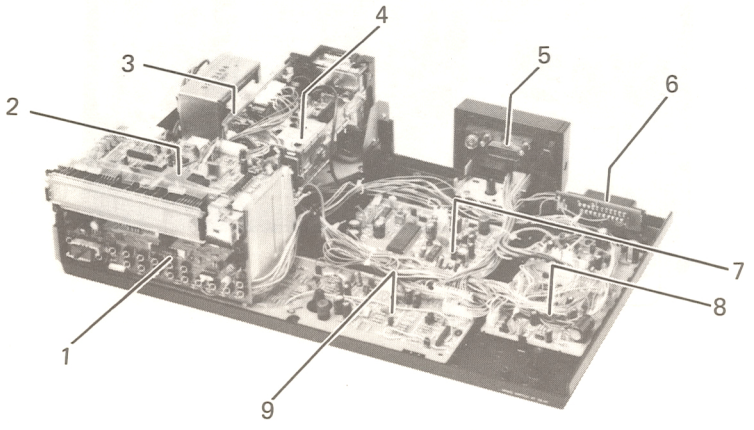


Fig. 37 PC Board Location

2. Removing the Case

1. Top cover (Fig. 38)

1) Remove 2 top cover fixing screws from the rear cover.
2) Lift the rear of the top cover to release its fitting with the front cover.

2. Connector case (Fig. 38)

1) Remove 2 screws from the connector case.
2) Lift the connector case.

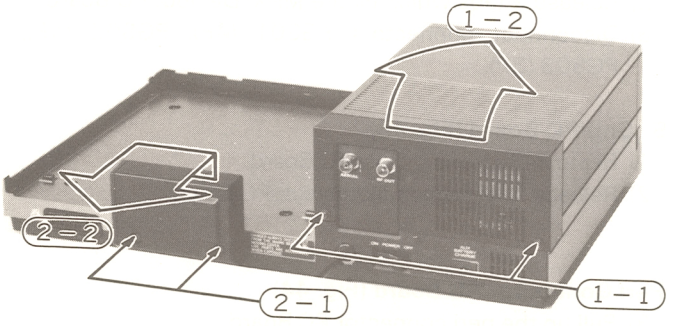


Fig. 38 Top Cover, Connector case

3. VTR Table (Fig. 39)

1) Remove 5 screws on the VTR table, and then lift the whole of the VTR table.

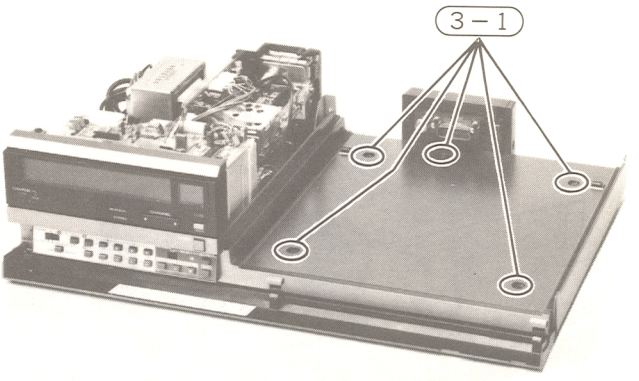


Fig. 39 VTR Table

4. Front panel (Fig. 40)

1) Remove the VTR Table
2) Remove 3 screws from the bottom cover.
3) Remove 2 screws from the top of the front panel.

* Engage the switch slider at the back of the front panel with the switch on the Timer/Input key PC Board when installing the front panel.

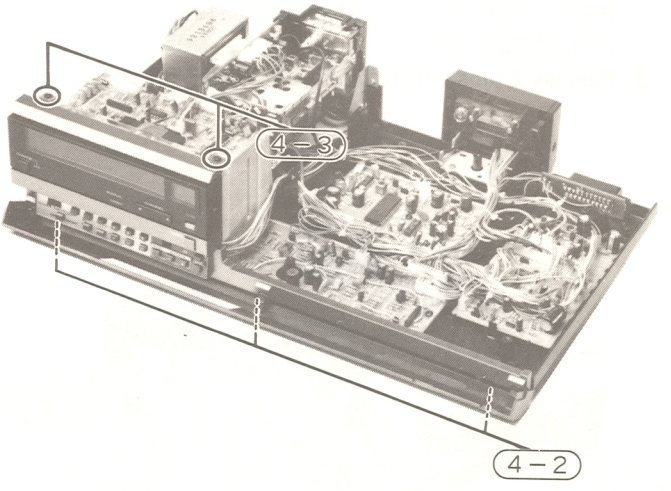


Fig. 40 Front Panel

7. Tuner/IF Block (Fig. 44)

1) Remove 2 screws fixing the rear panel.
2) Remove 3 tuner/IF block fixing screws.
3) Disconnect connectors PG751 (6P), PG752 (9P), PG753 (4P) and RF cable.
   * Tighten the screw near the regulator PC Board together with the chassis GND when installing the block.

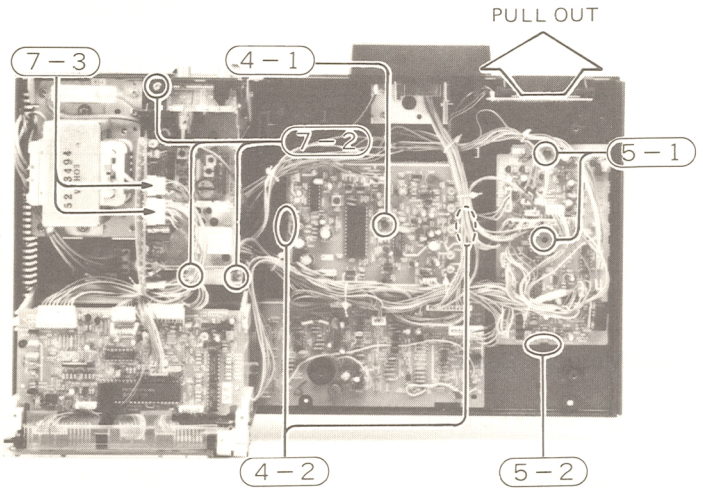
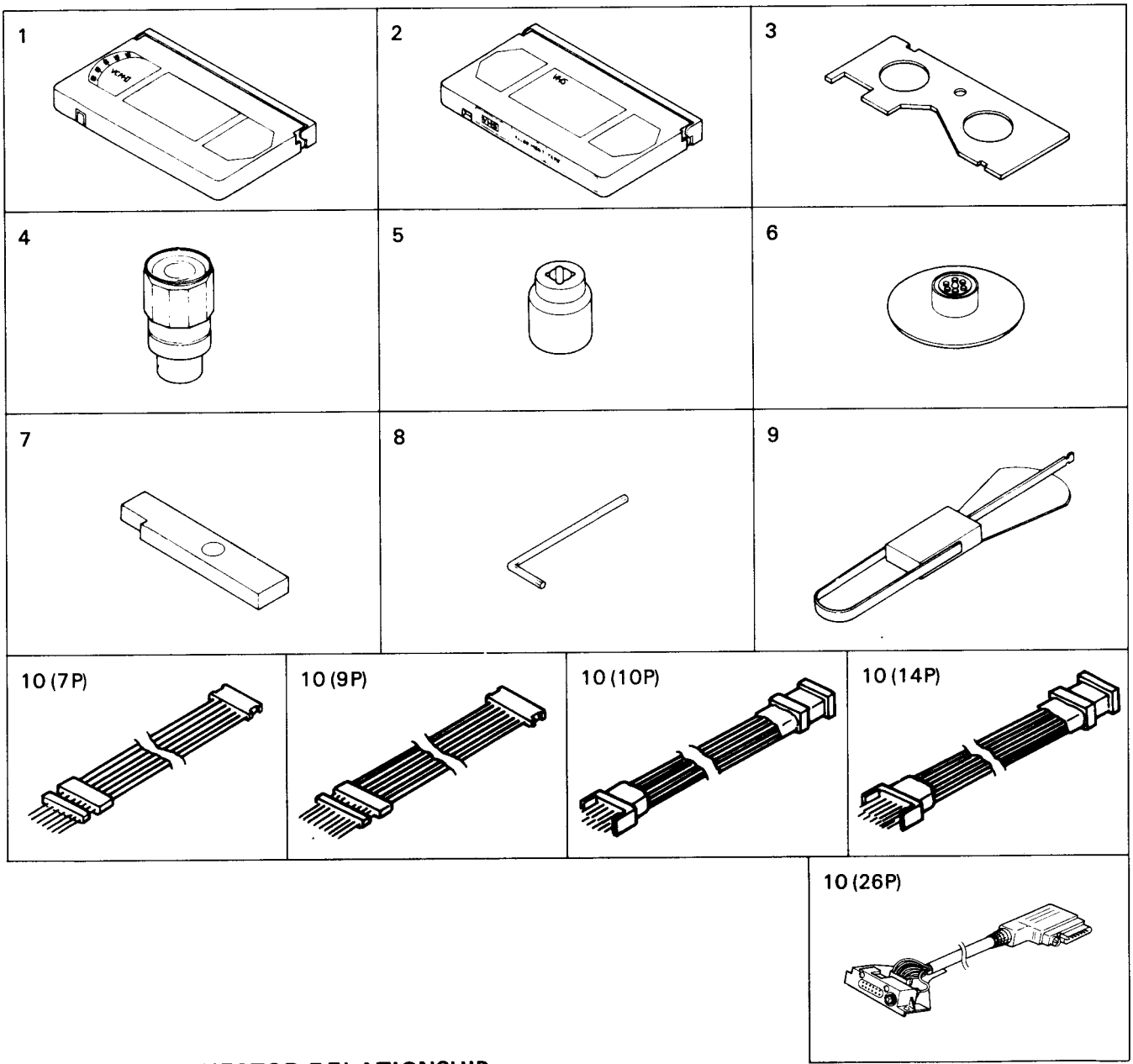


Fig. 44 MPX·Demod. PC Board, Sub PC Board, Peri Connector PC Board, Tuner/IF Block

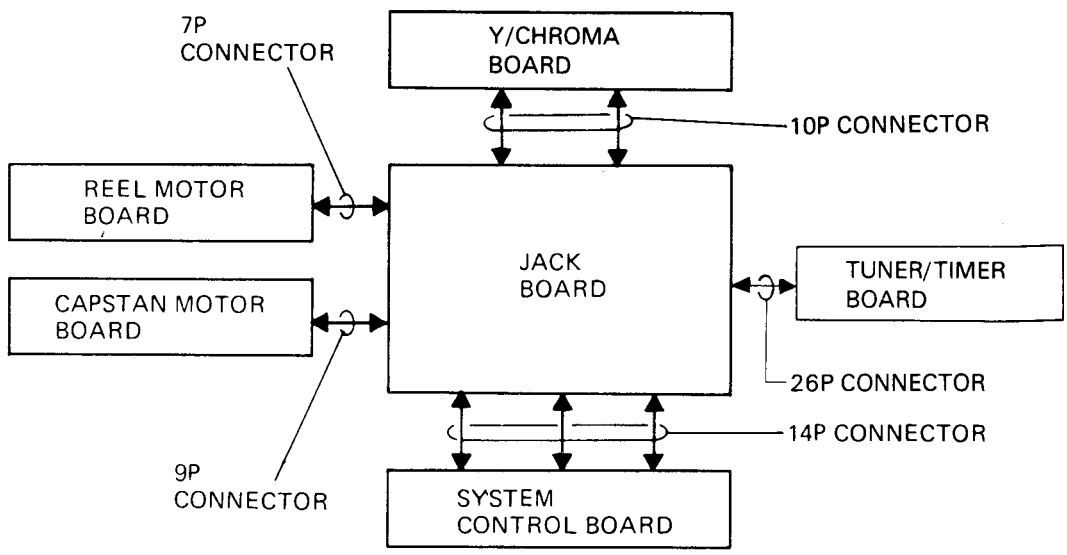
ADJUSTMENT

SERVICING JIGS AND TOOLS

ITEM	PARTS NAME		PARTS NO.
1.	Back tension meter		7099004
2.	Alignment tape		7099052
3.	Height reference plate (Master plane)		7099041
4.	Torque gauge		7099039
5.	Torque gauge adaptor		7099035
6.	Dummy reel		7099043
7.	Reel disk height jig		7099001
8.	1.5 mm hexagonal wrench		–
9.	Fan type tension gauge		–
10.	Relay connector (7P)	For Reel Motor PC Board	7099120
	Relay connector (9P)	For Capstan Motor PC Board	7099119
	Relay connector (10P)	For Y/chroma PC Board	7099118
	Relay connector (14P)	For System Control PC Board	7099117
	Relay connector (26p)	For Tuner/Timer PC Board	7099183



SERVICING CONNECTOR RELATIONSHIP



ELECTRIC CIRCUIT ADJUSTMENT

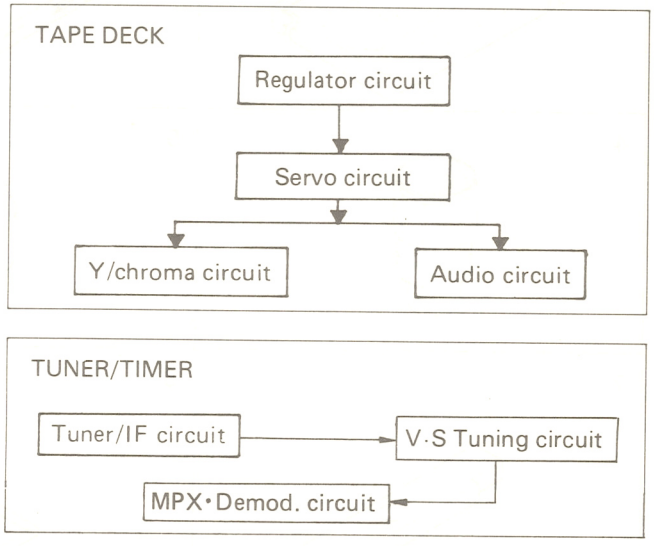
VT-8E (TAPE DECK)

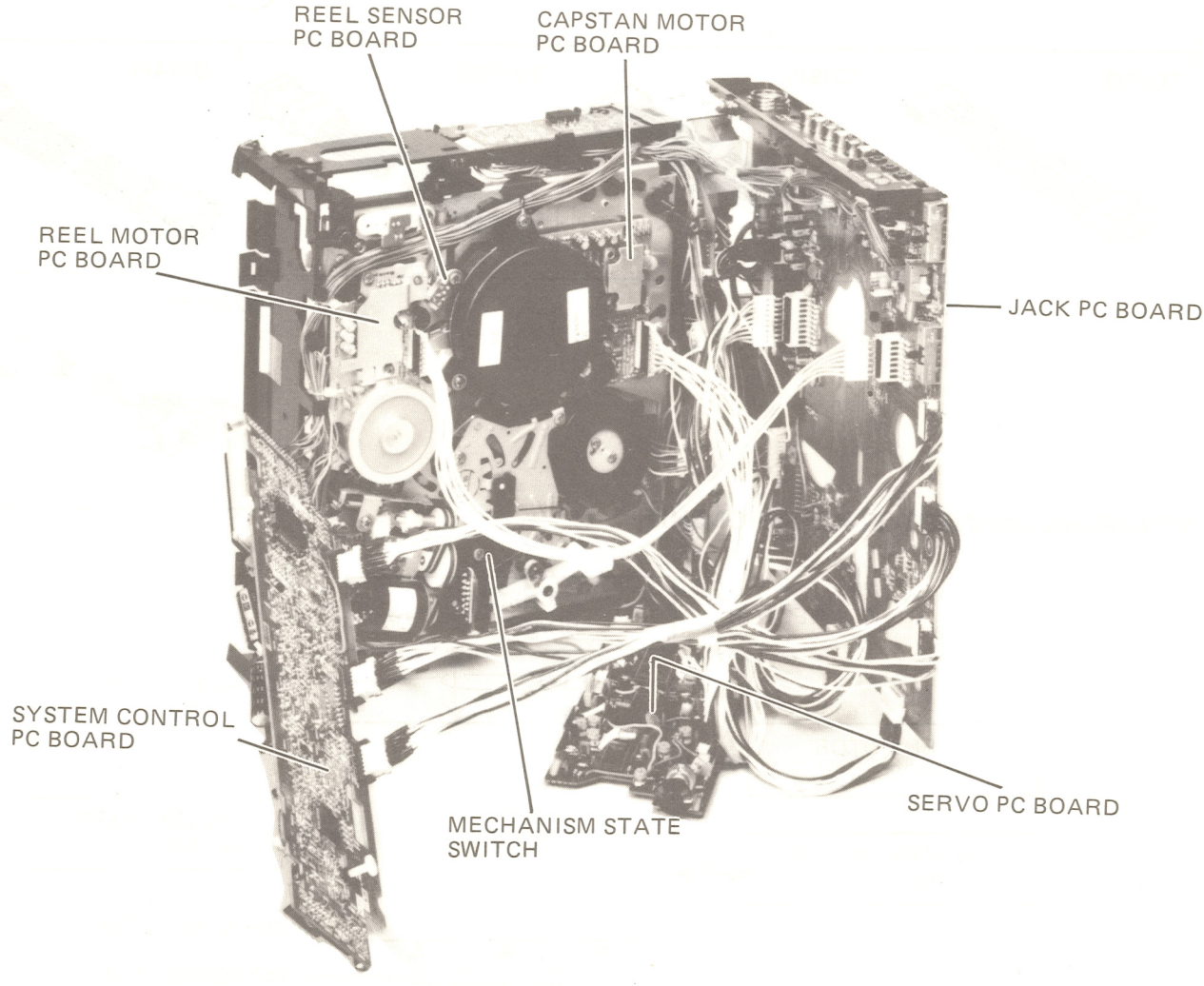
Test equipement, jigs and tapes required for overall circuit adjustment.

1) Colour TV set
2) Oscilloscope
3) VTVM
4) Colour bar signal generator
5) DC power supply
6) DC voltmeter
7) Alignment tape
8) Blank tape

Order of adjustment

Perform adjustment in the order shown below.



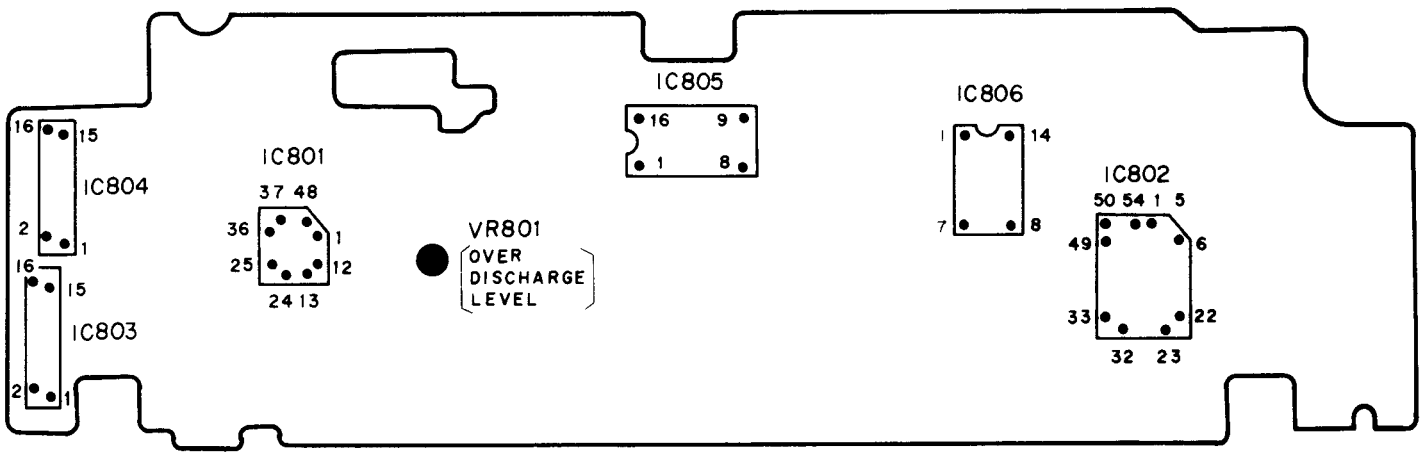


Portable VTR with the jack PC Board opened

Note: The VTR can be disassembled when the connectors shown on the previous page are used.
The servo board is not removed from the jack PC Board.

REGULATOR CIRCUIT ADJUSTMENT (System Control PC Board)

Parts locations



SYSTEM CONTROL PC BOARD (PARTS SIDE)

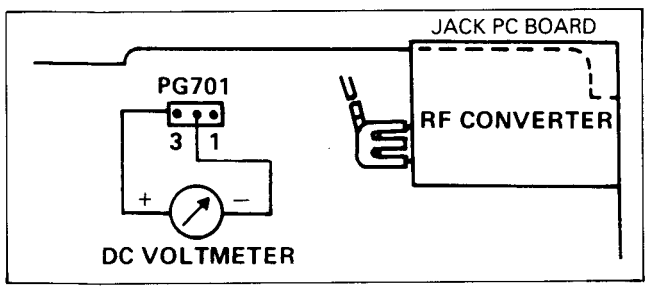
1. Over Discharge Level Adjustment

Set the battery overdischarge detection level to 11.5V by this adjustment. When the battery voltage drops to 10.3 – 10.8V, the VTR is automatically shut off to protect the battery from damage caused by overdischarge.
When this adjustment cannot be done properly and the set level is lower than 11.5V, the overdischarge detection level lowers and the battery service life deteiorates. On the other hand, when it is adjusted at a voltage higher than 11.5V, the usable time per charge is shortened.

Connecting test equipment

Connect a DC voltmeter and DC power supply to PG701 on the Jack PC Board as follows.

Connection: (+) to PG701 pin 3
(–) to PG701 pin 2



State of VTR

Stop mode

Position to be adjusted

VR801

Adjustment procedure

1) Turn VR801 fully clockwise.
2) Set the voltage of the DC power supply to 11.5V.
3) Turn VR801 counterclockwise so that "BATT" is indicated on the counter display on the system control PC Board.
4) After adjustment is completed, operate the DC Power supply to check that the VTR is automatically shut off when the Power voltage is set to 10.3-10.8V.

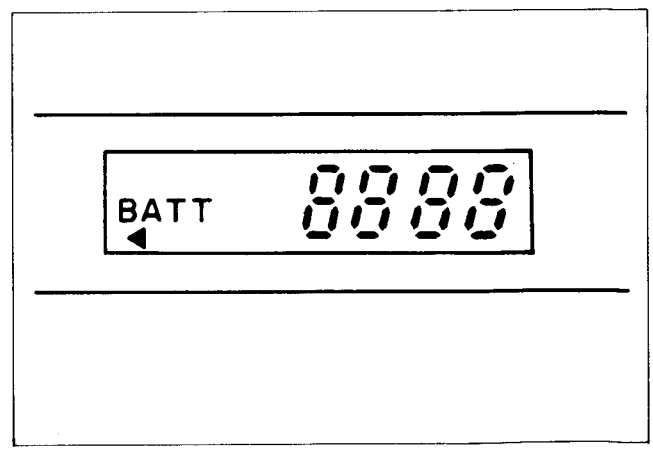


Fig. 1 LCD Display

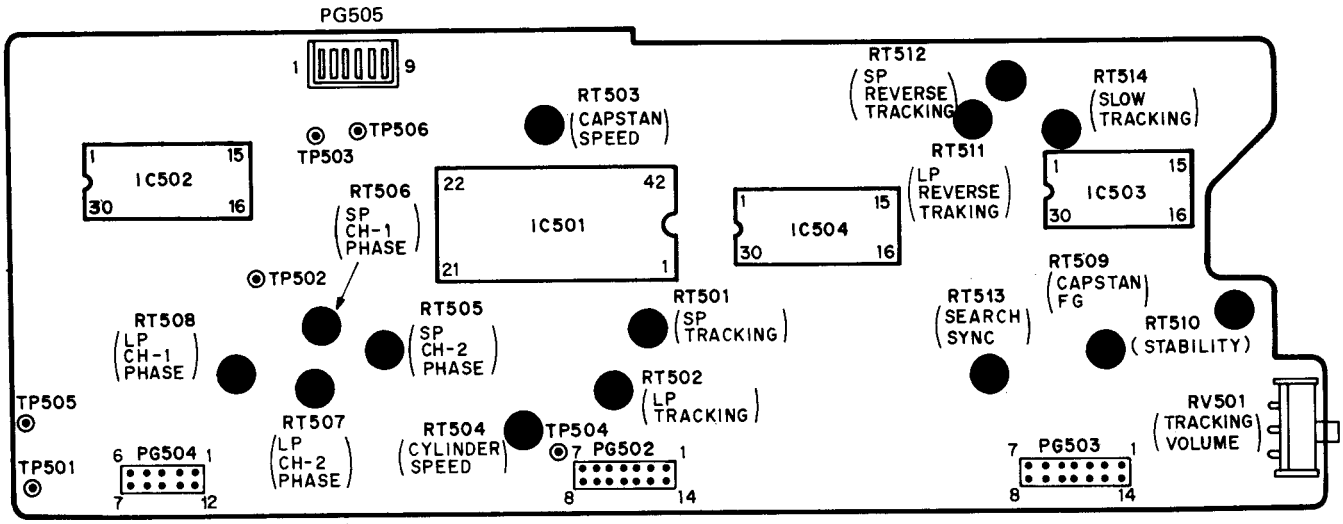
SERVO CIRCUIT ADJUSTMENT (Servo PC Board, Jack PC Board and Y/Chroma PC Board)

Parts locations

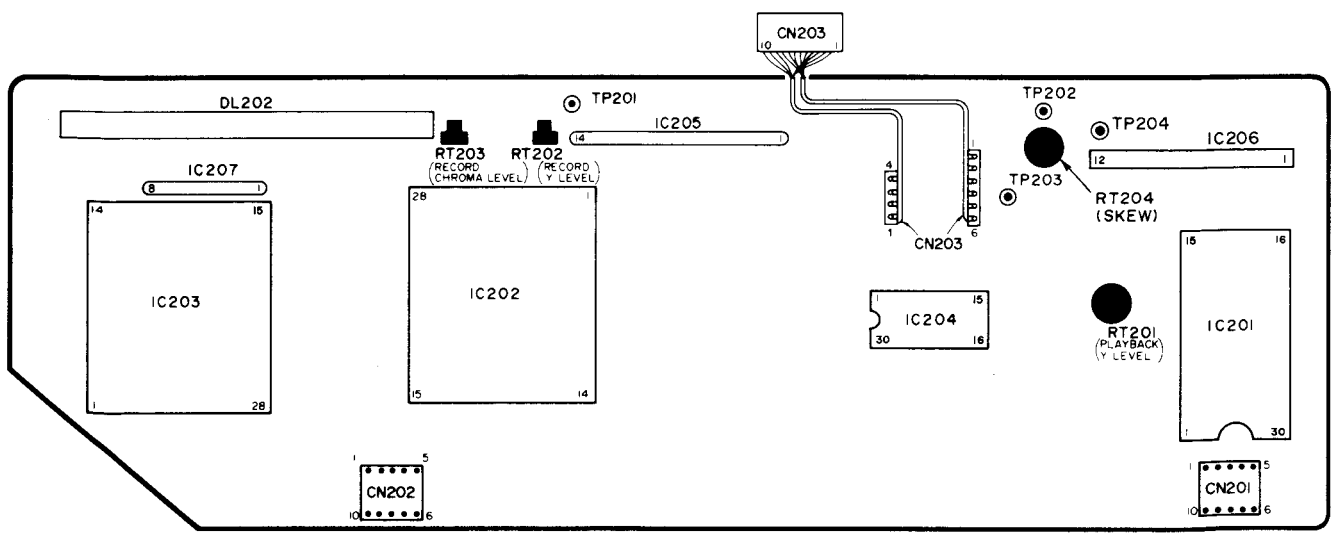
[Jack PC Board is described on page 39]

PG505
(TEST PLUG)

	1	GND
(TP502)	2	CYL. SPEED
(TP503)	3	CAPST. SPEED
(TP501)	4	CYL. FREE RUN
(TP506)	5	CAPST. FG
(TP505)	6	CAPST. FREE RUN
(TP504)	7	5V
	8	LP SPEED
	9	HEAD SW



SERVO PC BOARD (SOLDER SIDE)



Y/CHROMA PC BOARD (SOLDER SIDE)

1. Cylinder Speed Adjustment

This adjustment locks the cylinder servo to the system signals and maintains a constant cylinder speed of 1500 R.P.M.
When this adjustment cannot be done properly, horizontal stability is degraded or the picture has much noise.

Connecting test equipment

1) Connect the colourbar generator to the video input jack located on the side of the unit and feed colourbar signal.
2) Connect the oscilloscope to PG505 pin 2.

State of VTR

Set the record speed select switch to the SP position and set the unit with a blank tape to the record mode.

Position to be adjusted

RT504

Adjustment procedure

1) Short-circuit PG505 pin 4 and PG505 pin 7.
2) Adjust RT504 so that the sampling pulse superimposed on the sawtooth wave stands still or moves slowly.
3) Disconnect the short-circuit PG505 pin 4 and PG505 pin 7 (done in item 1). Check that the sampling pulse stands still at the trailing edge of the sawtooth wave.

2. Capstan Speed Adjustment

This adjustment locks the capstan servo to the system signals and maintains a constant tape transport speed.

SP: 2.34 cm/sec
LP: 1.17 cm/sec

When this adjustment cannot be done properly, the vertical stability of the picture is degraded or the picture has much noise.

Connecting test equipment

1) Connect the colourbar generator to the video input jack located on the side of the instrument and feed colour bar signal.
2) Connect the oscilloscope to PG505 pin 3.

State of VTR

Set the record speed select switch to the SP position and set the unit with a blank tape to the record mode.

Position to be adjusted

RT503

Adjustment procedure

1) Short-circuit PG505-PIN 6 and PG-PIN 7.
2) Adjust RT503 so that the sampling pulse superimposed on the sawtooth wave stands still or moves slowly.
3) Disconnect the short-circuit PG505-pin 6 and PG505-pin 7 (done in item 1). Check that the sampling pulse stands still at the leading edge of the sawtooth wave.

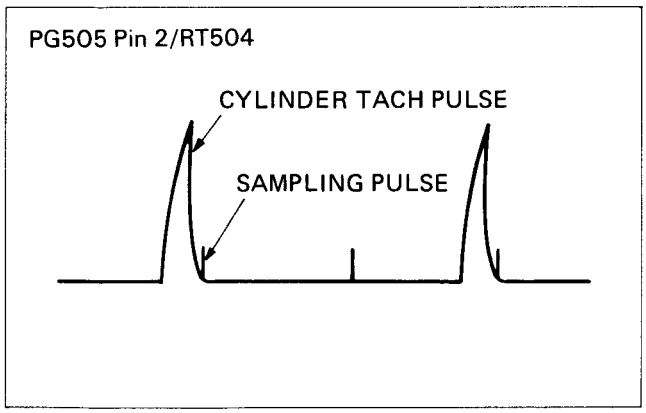


Fig. 2 Cylinder speed

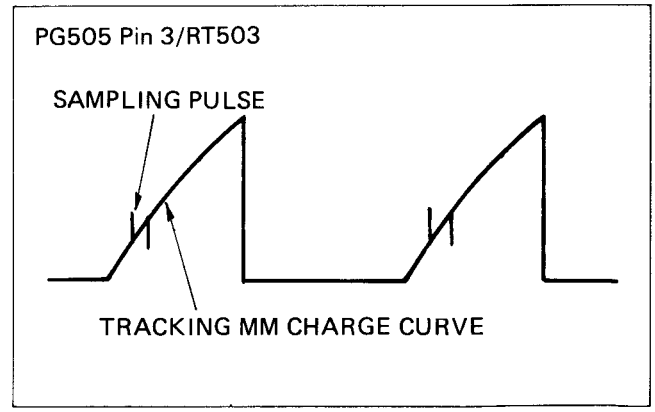


Fig. 3 Capstan speed

3. SP/LP Head Switching Point Adjustment

CH-1 MM and CH-2 MM of the cylinder tach pulse circuits determine the video head switching point during playback. Misadjustment of CH-1 MM and CH-2 MM of the cylinder tach pulse circuits may cause the head switching noise in the picture and/or vertical jitter.

Connecting test equipment

1) Connect CH-1 terminal of the oscilloscope to TP202 (SW25 Hz signal output) on the Y/Chroma PC Board.
2) Connect CH-2 terminal of the oscilloscope to the video output jack located on the side of unit.

State of VTR

Playback the alignment tape.

SP head switching point

Position to be adjusted

RT506 (CH-1 PHASE)
RT505 (CH-2 PHASE)

Adjustment procedure

1) Apply synchronization in CH-1 and set the sync slope to (–).
2) Adjust RT506 so that the vertical sync front porch is set to 6.5 ± 0.5 horizontal lines after trailing edge of the SW 25 Hz signal.
3) Set the sync slope to (+).
4) Adjust RT505 so that the vertical sync front porch is set to 6.5 ± 0.5 horizontal lines after leading edge of the SW 25 Hz signal.

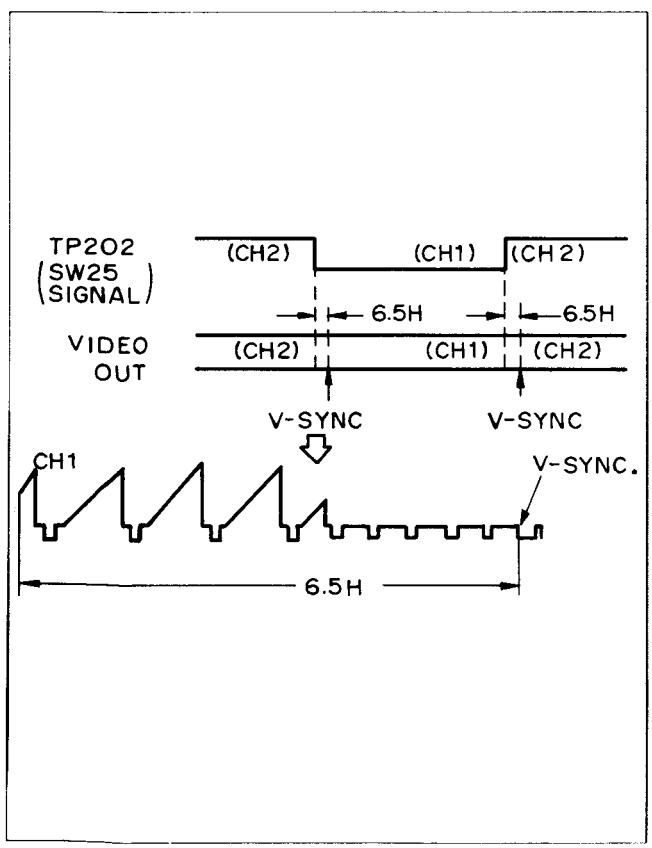


Fig. 4 Head Switching Point

LP head switching point

- Chort-circuit PG505-1, PG505-8 and PG505-9 to forcibly select the LP head.

Position to be adjusted

RT508 (CH-1 PHASE)
RT507 (CH-2 PHASE)

Adjustment procedure

1) Apply synchronization in CH-1 and set the sync slope to (–).
2) Adjust RT508 so that the vertical sync front porch is set to 6.5 ± 0.5 horizontal lines after trailing edge of the SW 25 Hz signal.
3) Set the sync slope to (+).
4) Adjust RT507 so that the vertical sync front porch is set to 6.5 ± 0.5 horizontal lines after leading edge of the SW 25 Hz signal.

4. SP/LP Tracking Preset Adjustment

Tracking during playback of the tape recorded on this VTR is done by these adjustments. When these adjustments are incorrect, it results in a noisy picture with the tracking control set to the center click position or noise may not be removed completely with the tracking control turned.

Connecting test equipment

1) Connect the colourbar generator to the video input jack located on the side of unit and feed colour bar signal.
2) Connect CH-1 terminal of the oscilloscope to PG505 pin 3.
3) Connect CH-2 terminal of the oscilloscope to the video output jack located on the side of unit.
4) Set the tracking control to its center click position.

SP Tracking Preset

State of VTR

1) Set the record speed select switch to the SP position and set the unit with a blank tape to the record mode. (Record for the time enough to adjust during playback.)
2) Rewind the tape and playback the recorded signal.

Position to be adjusted

RT501

Adjustment procedure

1) Apply synchronization in CH-1 and set the sync slope to (+).
2) Adjust RT501 (SP tracking preset) to align the positive peak of the CTL pulse and V. SYNC in the video signal.

LP Tracking Preset

State of VTR

1) Set the record speed select switch to the LP position and set the unit with a blank tape to the record mode. (Record for the time enough to adjust during playback.)
2) Rewind the tape and playback the recorded signal.

Position to be adjusted

RT502

Adjustment procedure

1) Apply synchronization in CH-1 and set the sync slope to (+).
2) Adjust RT502 (LP tracking preset) to align the positive peak of the CTL pulse and V. SYNC in the video signal.

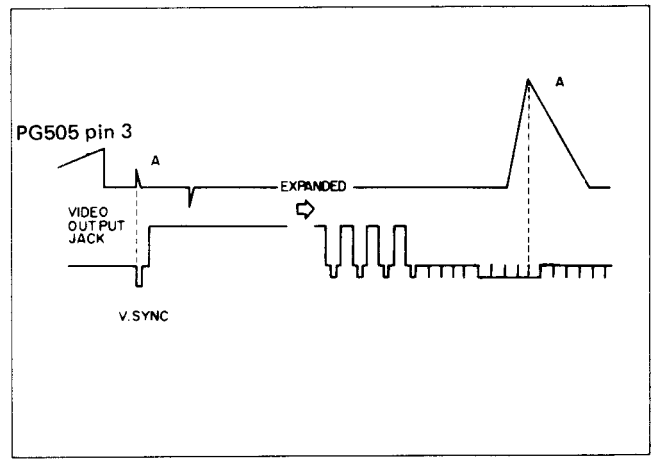


Fig. 5 Tracking Preset

5. Capstan FG Adjustment

This adjustment sets the duty of the CFG pulse within the specified values, causing the VTR to operate normally in the slow mode.

Connecting test equipment

1) Connect the colourbar generator to the video input jack located on the side of unit and feed colour bar signal.
2) Connect the oscilloscope to PG505 pin 5.

State of VTR

Set the record speed select switch to the SP position and set the unit with a blank tape to the record mode.

Position to be adjusted

RT509

Adjustment procedure

1) Adjust RT509 so that the duty of the waveform is set to 50%-50%.

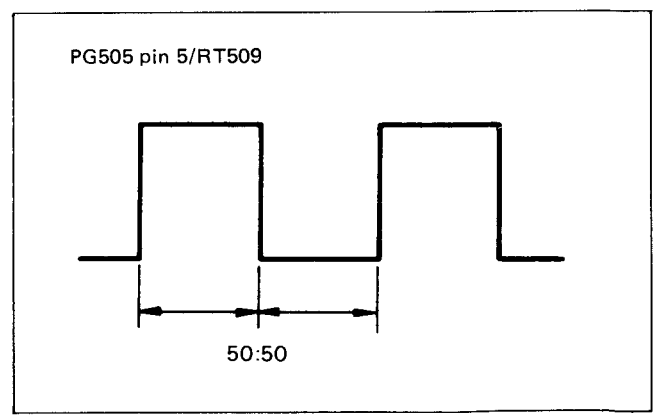


Fig. 6 Capstan FG

6. Search Sync Adjustment

This adjustment makes the frequency of the horizontal sync signal in the forward/reverse search and still pause modes the same as that in the play mode. If this adjustment is not complete, misconvergence occurs. Perform this adjustment in the still pause mode.

Connecting test equipment

1) Connect the colourbar generator to the video input jack located on the side of unit and feed colourbar signal.
2) Connect the oscilloscope to the video output jack.

State of VTR

1) Set the record speed select switch to the SP position and set the unit with a blank tape to the record mode. (Record for the time enough to adjust during playback.)
2) Rewind the tape and playback the record signal.

Position to be adjusted

RT513

Adjustment procedure

1) Obtain a 1H period of the video signal on the oscilloscope by the delay operation or horizontal scan enlarging operation.
   (Since the waveforms cannot be observed at the same time in the still pause and play modes, located horizontal sync signal (A) during play on the place easy to be observed.)
2) Place the VTR in the still pause mode and adjust RT513 to cancel the drift of the phases (betweeen A and A') of the horizontal sync signals between in the play and still pause modes.

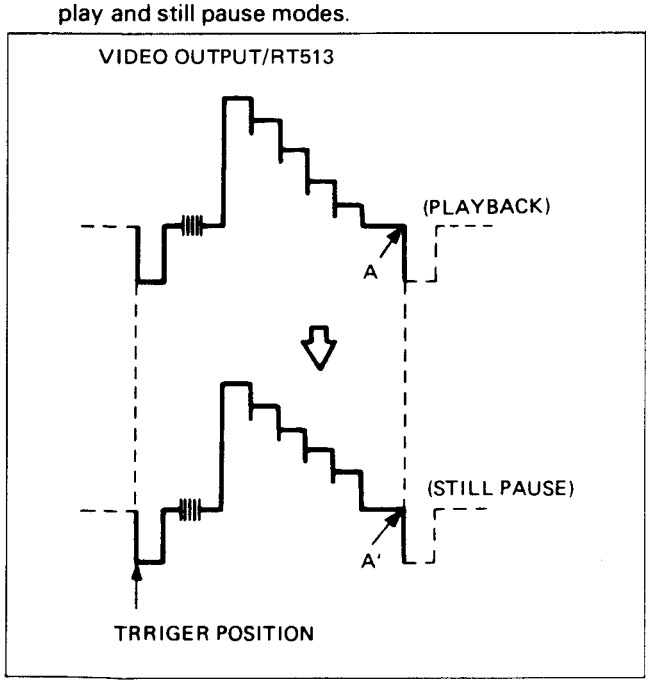


Fig. 8 Search Sync

7. SP/LP Reverse Playback Tracking Adjustment

Tracking during reverse playback of the tape recorded on this VTR is done by these adjustment.
When these adjustments are incorrect, the noise band appears on the center of the screen during reverse playback.

Connecting test equipment

1) Connect the colourbar generator to the video input jack located on the side of unit and feed colourbar signal.
2) Connect the RF output to the TV AERIAL terminal.
3) Set the tracking control to its center click position.

SP reverse playback tracking

State of VTR

1) Set the record speed select switch to the SP position and set the unit with a blank tape to the record mode. (Record for the time enough to adjust during reverse playback.)
2) Playback the recorded signal in the reverse mode.

Position to be adjusted

RT512

Adjustment procedure

Adjust RT512 to appear the noise band while moving it center to the top and bottom on the screen.

LP reverse playback tracking

State of VTR

1) Set the record speed select switch to the LP position and set the unit with a blank tape to the record mode. (Record for the time enough to adjust during reverse playback.)
2) Playback the recorded signal in the reverse mode.

Position to be adjusted

RT511

Adjustment procedure

Adjust RT511 to appear the noise band while moving it center to the top and bottom on the screen.

8. Slow Tracking Adjustment

Tracking during slow playback of the tape recorded on this VTR is done by this adjustment. When the adjustment is incorrect, the noise band appears on the center of the screen during slow playback.

Unplug the AC cord to reset the slow tracking circuit before performing this adjustment.

Connecting test equipment

1) Connect the colourbar generator to the video input jack located on the side of unit and feed colourbar signal.
2) Connect the RF output to the TV AERIAL terminal.

State of VTR

1) Set the record speed select switch to the SP position and set the unit with a blank tape to the record mode. (Record for the time enough to adjust during playback.)
2) Rewind the tape and playback the recorded signal in the slow mode.

Position to be adjusted

RT514

Adjustment procedure

Adjust RT514 to eliminate the noise band while moving it to the top or bottom on the screen.

9. Stability Adjustment

This is done to control the lateral shakes of the picture occurring due to the intermittent operation during the slow speed. Incorrect adjustment causes lateral shakes of the picture.
This adjustment is done in sequence with the completion of the capstan slow mode adjustment.

Connecting test equipment

1) Connect the colourbar generator to the video input jack located on the side of unit and feed colourbar signal.
2) Connect the RF output to the TV AERIAL terminal.

State of VTR

1) Set the record speed select switch to the SP position and set the unit with a blank tape to the record mode. (Record for the time enough to adjust during playback.)
2) Rewind the tape and playback the recorded signal in the slow mode.

Position to be adjusted

RT510

Adjustment procedure

Adjust RT510 so that the lateral shakes of the picture is minumum.

10. Vert Drive Pulse Adjustment

Connecting test equipment

1) Connect the colourbar generator to the video input jack located on the side of unit and feed colourbar signal.
2) Connect the RF output to the TV AERIAL terminal.

SP Vert Drive Pulse Adjustment

State of VTR

1) Set the record speed select switch to the SP position and set the unit with a blank tape to the record mode. (Record for the time enough to adjust during playback).
2) Rewind the tape and playback the recorded signal in the still mode.

Position to be adjusted

RT702

Adjustment procedure

Adjust RT702 so that the center of the picture shows minimum motion.

LP Vert Drive Pulse Adjustment

State of VTR

1) Set the record speed select switch to the LP position and set the unit with a blank tape to the record mode. (Record for the time enough to adjust during playback.)
2) Rewind the tape and playback the recorded signal in the still mode.

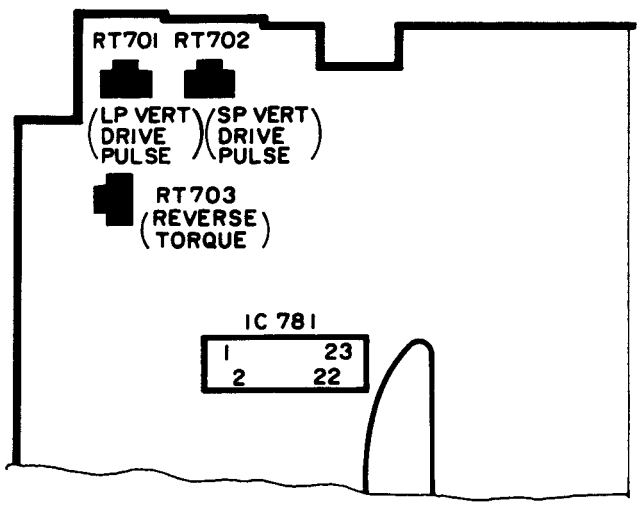
Position to be adjusted

RT701

Adjustment procedure

Adjust RT701 so that the center of the picture shows minimum motion.

Jack Circuit Board Parts Location



JACK P.C BOARD (PARTS SIDE)

11. Reverse Torque Adjustment

This adjustment controled the torque of the reel motor.
When this adjustment is incorrect, slack of the tape occurs if the torque is weak and the tape is tangled and tape trouble becomes unstable if the torque is strong.

Connecting test equipment

1) Connect the colourbar generator to the video input jack located on the side of unit and feed the colourbar signal.
2) Connect the VTVM to the CN707 pin 5.

State of VTR

1) Playback the recorded tape at reverse play mode.

Position to be adjusted

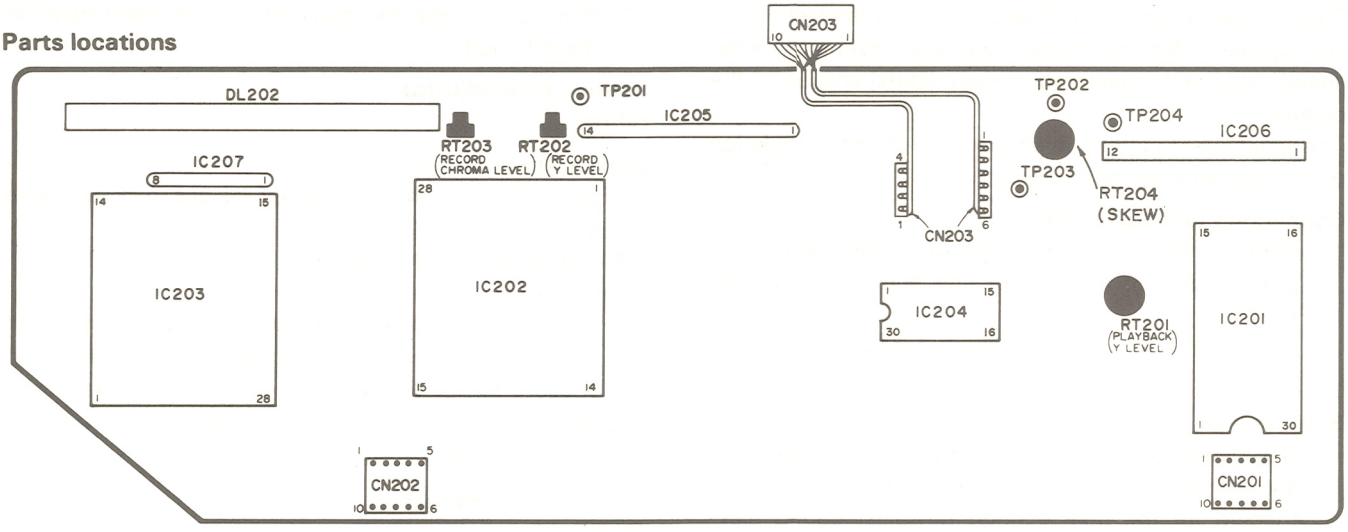
RT703

Adjustment procedure

Adjust reel motor drive (RT703) for 3.7 $\pm$0.1 V.

Y/CHROMA CIRCUIT ADJUSTMENT (Y/Chroma PC Board)

Parts locations



Y/CHROMA PC BOARD (SOLDER SIDE)

1. Record Chroma and Y Level Adjustments

RECORD CHROMA LEVEL

Optimum colour level when recording is regulated by this adjustment.

When adjustment is not complete and the level is too high, the diamond beats can be seen in the screen; on the other hand, when the level is too low, the colour S/N ratio deteriorates, that is, colour is degraded.

RECORD Y LEVEL

Optimum record Y level is regulated by this adjustment.

When adjustment is not complete and the level is too high, B/W may invert or the S/N ratio may deteriorate, that is, the picture may become rough. On the other hand, when the level is too low, the S/N ratio deteriorates.

Record Y level

Level
130 ± 5 mVp-p

Record chroma level

Cylinder mark	Level
No mark	30 ± 3 mVp-p
1	35 ± 3 mVp-p
2	40 ± 3 mVp-p
3	45 ± 3 mVp-p
4	45 ± 3 mVp-p

Table 1

Connecting test equipment

1) Connect the colourbar generator to the video input jack located on the side of the unit and feed colour bar signal.
2) Connect the oscilloscope to TP203.

State of VTR

Set the record speed select switch to the LP position and set the unit with a blank tape to the record mode.

Position to be adjusted

RT203 (Record Chroma Level)
RT202 (Record Y Level)

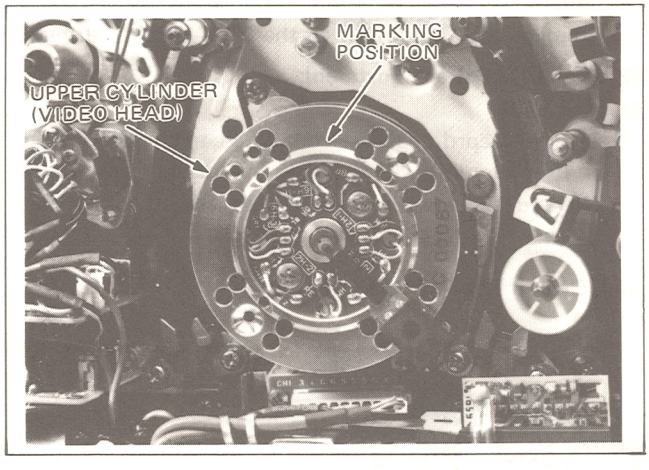


Fig. 9 Cylinder marking

Adjustment procedure

1) Turn RT202 fully counter-clockwise.
2) Adjust RT203 to set the max. chroma signal to the marked value.
3) Adjust RT202 to set the sync tip to 130 ± 5 mVp-p.

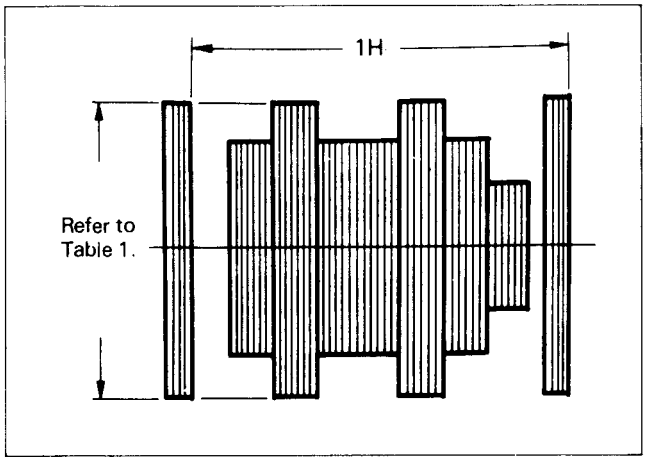


Fig. 10 Record Chroma Level

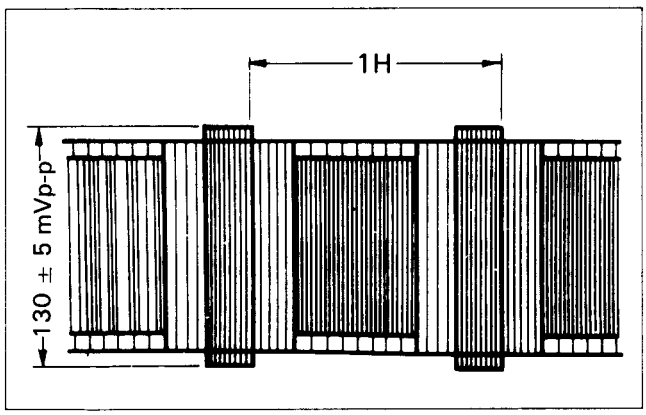


Fig. 11 Record Y Level

2. Playback Y Level Adjustment

Optimum playback Y level is regulated by this adjustment.

Connecting test equipment

1) Connect the colour bar generator to the video input jack located on the side of the unit and feed colourbar signal.
2) Connect the oscilloscope to the video output jack located on the side of the unit.

State of VTR

1) Set the record speed select switch to the SP position and set the unit with a blank tape to the record mode. (Record for the time enough to adjust during playback.)
2) Rewind the tape and playback the recorded signal.

Position to be adjusted

RT201

Adjustment procedure

Adjust RT201 to set the video output (No-terminated) to 2.0 ± 0.1 Vp-p.

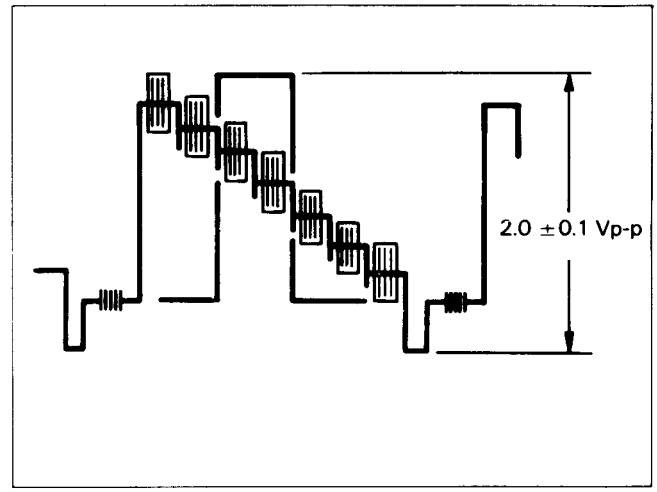


Fig. 12 Playack Y Level

3. Skew Adjustment

Connecting test equipment

1) Connect the colour bar generator to the video input jack located on the side of the unit and feed colour bar signal.
2) Connect the oscilloscope to the video output jack located on the side of the unit.

State of VTR

1) Set the record speed select switch to the LP position and set the unit with a blank tape to the record mode. (Record for the time enough to adjust during playback.)
2) Rewind the tape and playback the reverse mode.

Position to be adjusted

RT204

Adjustment procedure

Adjust RT204 for each V. sync level to be equal as shown in Fig. 12-1.

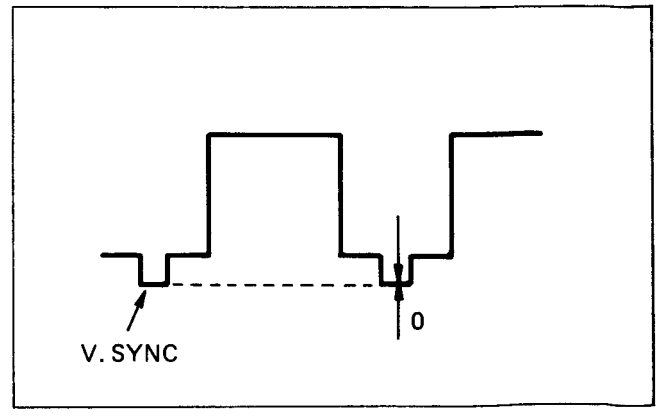
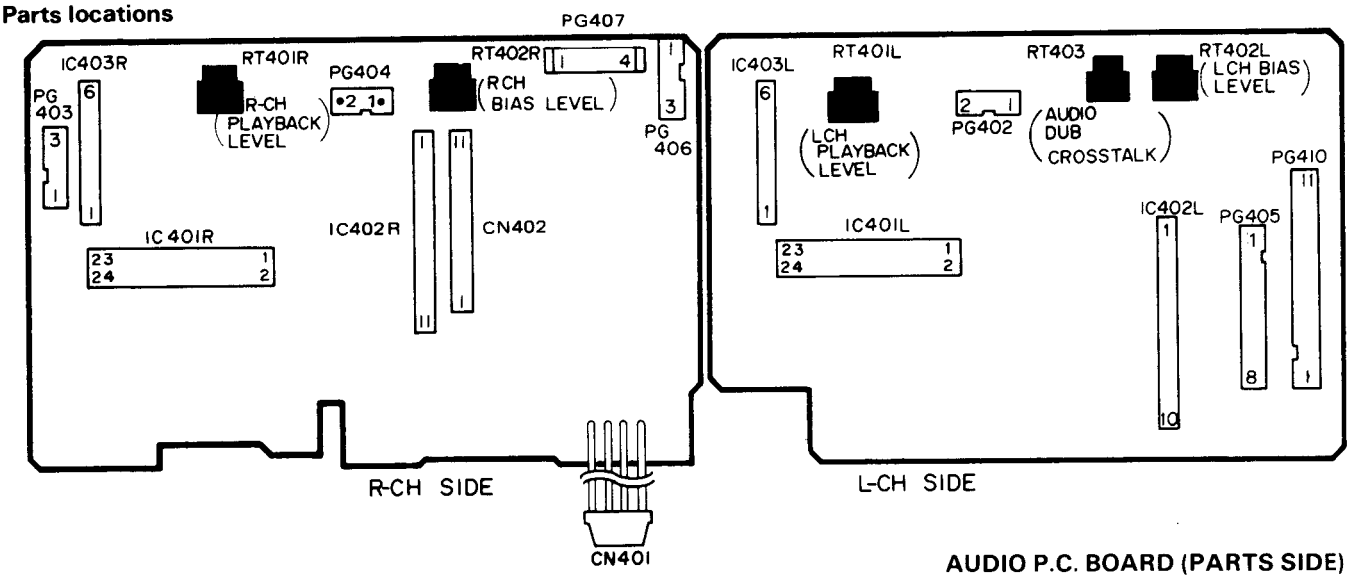


Fig. 12-1

AUDIO CIRCUIT ADJUSTMENT (Audio PC Board)

Parts locations



AUDIO P.C. BOARD (PARTS SIDE)

1. Playback Level Adjustment

This adjustment sets the audio output signal to the specified level.

Connecting test equipment

1) Connect the VTVM to the R-ch audio output jack on the side panel.
2) Connect the VTVM to the L-ch audio output jack on the side panel.

State of VTR

Playback the 1 kHz audio track section of the alignment tape.

Position to be adjusted

RT401L
RT401R

Adjustment procedure

1) Adjust RT401R (R-CH PLAYBACK LEVEL) so that the reading of the VTVM is −8 dBm ± 1 dBm.
2) Adjust RT401L (L-CH PLAYBACK LEVEL) so that the reading of the VTVM is −8 dBm ± 1 dBm.

2. Audio Bias Level Adjustment

Optimum audio record bias is regulated by this adjustment. When adjustment is not complete and the level is too low, high frequencies are boosted and distortion increases. On the contrary, when the level is too high, frequency response deteriorates, that is, high frequency are degraded.

Connecting test equipment

1) Connect the VTVM to R-ch of the audio/control head as shown in Fig. 13.
2) Connect the VTVM to L-ch of the audio/control head as shown in Fig. 13.

State of VTR

Load the VTR with a blank tape and place in "SP Record" mode.

Position to be adjusted

RT402R
RT402L

Adjustment procedure

1) Adjust RT402R (R-CH BIAS LEVEL) so that the reading of the VTVM is 310μA.
2) Adjust RT402L (L-CH BIAS LEVEL) so that the reading of the VTVM is 310μA.

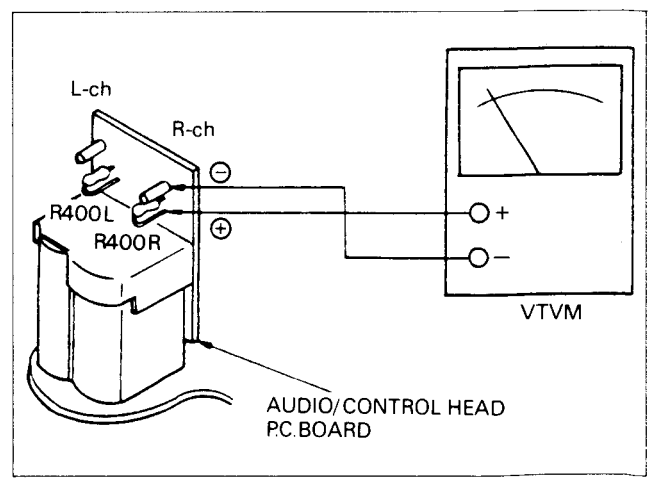


Fig. 13 Audio Control Head

3. Audio Dub Crosstalk Adjustment

This adjustment prevents the sound from one channel leaking to the other channel causing the audio signals to overlap.

Connecting test equipment

1) Connect CH-1 terminal of the oscilloscope to the L-ch audio output jack on the side panel .

State of VTR

1) Connect an audio generator to the R-ch audo input jack on the side panel and apply a –8 dBm/1 kHz signal.
2) Move the audio channel select switch to the AUDIO CH–1 + CH–2 position.
3) Set the sound with sound switch to the ON position and place the instrument in the R-ch audio dub mode.

Position to be adjusted

RT403

Adjustment procedure

1) Adjust the audio dub closstalk control (RT403) to portion A of waveform is minimum.

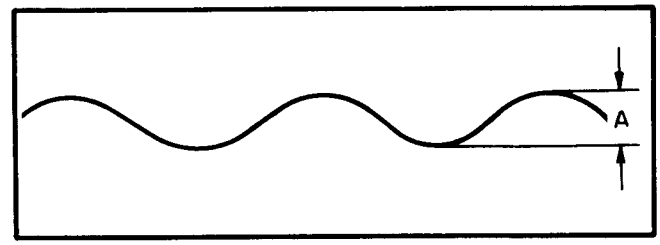
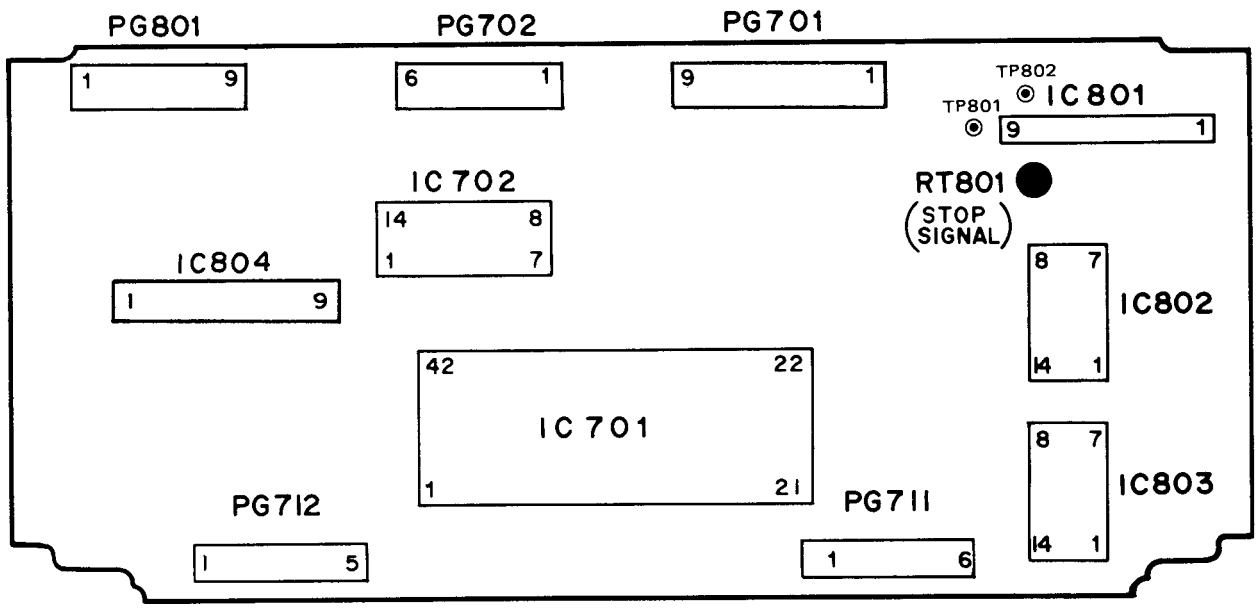


Fig. 14 Audio Dub Closstalk

VT-TU8E (TUNER/TIMER)

V·S TUNING CIRCUIT ADJUSTMENT (V·S Tuning P.C. Board)

Parts locations



V·S Tuning P.C. Board (PARTS SIDE)

1. Stop signal adjustemnt

Perform this adjustment to set so that the H-sync signal 15.625 kHz can be osillated precisely.

Connecting test equipment

Connect the frequency counter to TP802.

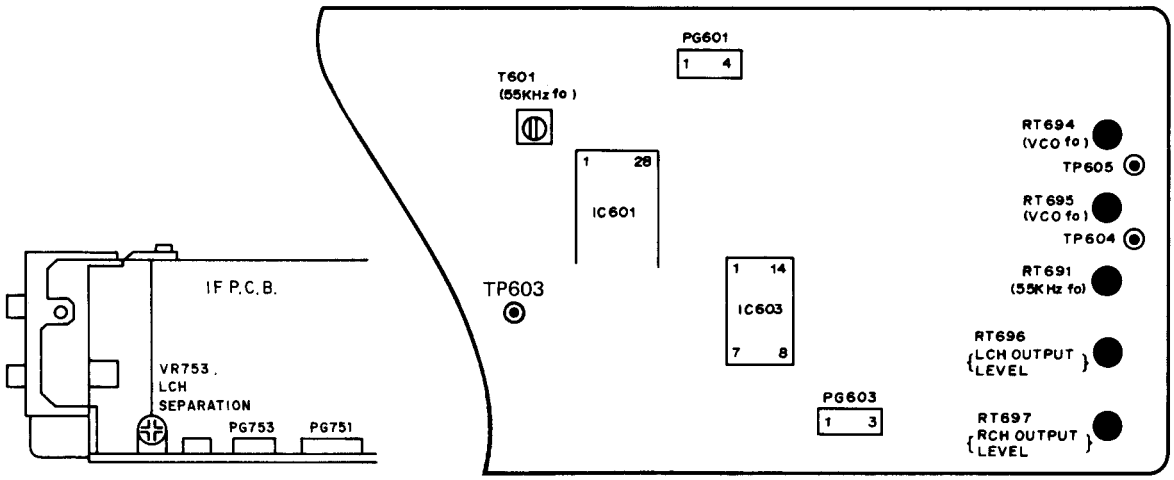
Position to be adjusted

RT801

Adjustment procedure

Adjust RT801 so that the reading of the frequency counter is 15.625kHz ± 50 Hz.

MULTIPLEX DEMODULATOR CIRCUIT ADJUSTMENT



Tuner/IF P.C.Board (TOP VIEW) **Multiplex Demodulator Circuit Board (parts side)**

Note: Set all the semi-variable resistors on the demodulator board to around the center of their variable ranges.

1. 55 kHz fo Adjustment

Connecting test equipment

1) Connect the oscilloscope to the test point terminal TP603.

State of VTR

1) Receive a stereo broadcast.

Postion to be adjusted

RT691, T601

Adjustment procedure

1) Adjust RT691 so that the waveform is 100m Vp-p.
2) Adjust T601 so that the waveform is maximized.
3) Adjust RT691 so that the waveform is 120m Vp-p.

2. VCO fo Adjustment

Connecting test equipment

1) Connect a capacitar (47μF/16V) between TP603 and GND.
2) Connect the oscilloscope to the test point terminal TP604 (TP605).

State of VTR

1) Receive a monaural broadcast.

Position to be adjusted

RT695 (RT694)

Adjustment procedure

1) Adjust RT695 (RT694) so that the frequency of the wave is 235 $\pm$ 2 Hz (548 $\pm$ 2 Hz).

3. L-CH Separation Adjustment

Connecting test equipment

1) Connect the oscilloscope to the Audio output jack (L ch) on the side panel.

State of VTR

1) Receive a stereo broadcast.

Position to be adjusted

VR753

Adjustment procedure

1) Cut off the modulation of L-channel.
2) Adjust VR753 so that the R-CH signal is minimized.

4. L-CH/R-CH Output Level Adjustments

Connecting test equipment

1) Connect the VTVM to the Audio output jack (L-ch (R-ch)) on the side panel.

State of VTR

1) Receive a monaural broadcast.

Position to be adjusted

RT696 (L-CH)
RT697 (R-CH)

Adjustment procedure

1) Adjust RT696 (L-CH) and RT697 (R-CH) so that they are both -15 ± 0.5 dBm.

MECHANICAL ADJUSTMENT

1. Mechanism State Switch Adjustment

This switch is positioned near the loading gear at the bottom of the chassis, it detects the loading condition of the mechanism and controls the loading motor.
When this switch is not installed properly, loading is not done correctly and the mechanism does not operate noramally.

1) Turn the worm pulley counterclockwise by hand until just before the resistance becomes great. The top of the rhomboid groove in the drive gear should be seen within 1.3 mm from end A. (This is the STOP mode position.)
2) Loosen the mechanism state switch fixing screw to slide the switch.
3) Tighten the screw at the position with the V groove showing the STOP mode and the triangular hole in the switch knob match. (Error: +0.15 mm in the loading direction and +0.25 mm in the unloading direction. Perform adjustment while viewing from just above.)

Operation check

Check operations after installation and adjustment.

1) Turn the worm pulley clockwise and check that the triangular hole matches the 5th V groove from the STOP mode position when the worm pulley is turned fully, and then turn the worm pulley counterclockwise and check that the STOP mode V groove and the triangular hole match when the worm pulley is turned fully.
2) Load a blank tape to do all operations and check that loading/unloading operations are performed correctly.

The above operations are not performed, adjust the switch again.

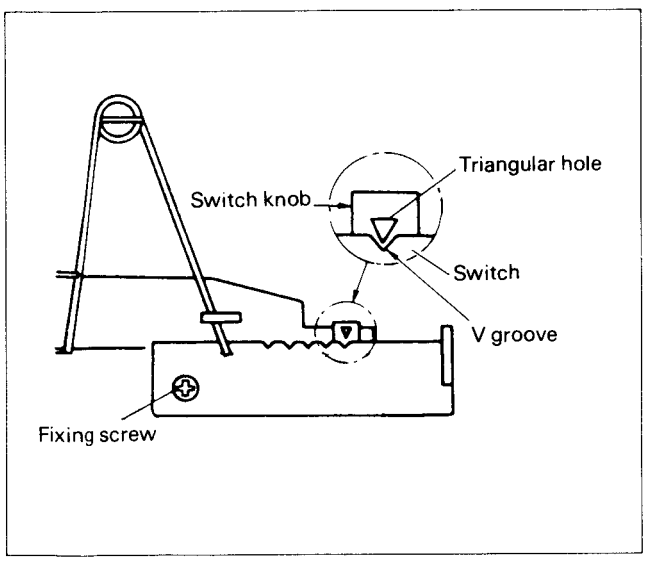


Fig. 1 Mechanism State Switch

2. Tape Transport Parts Check/Adjustment

The tape transport system is the system that moves the tape from the supply reel to the take-up reel via the video head. The transport system parts, especially the parts which directly come into contact with the tape should be kept in a clean condition in which contact surfaces are not scratched, with no dust and oil, etc. adhering to them.
The tape transport system has been adjusted in the factory before shipment, so when the transport system parts are replaced, be sure to adjust the new parts to stabilize the tape transport system.
Do not loosen the fixing screws of the parts shown below. When it is required to replace them be sure to install them to the same positions as before.

1) Both supply/take-up catchers
2) Both supply/take-up inclined guide

1. Reel disk height adjustment

1) Remove the top cover and cassette lid, place the master plane on the cassette holder and lower the holder.
2) Place a right-angle gauge on the master plane and fit it to the reel disk.
3) Check that the top of the reel disk is positioned between sections A and B of the reel disk height jig.
4) When the top of the reel disk is not between sections A and B, adjust the numbers of spacers at the bottom of the reel disk (thickness: 0.25 mm, 0.5 mm)

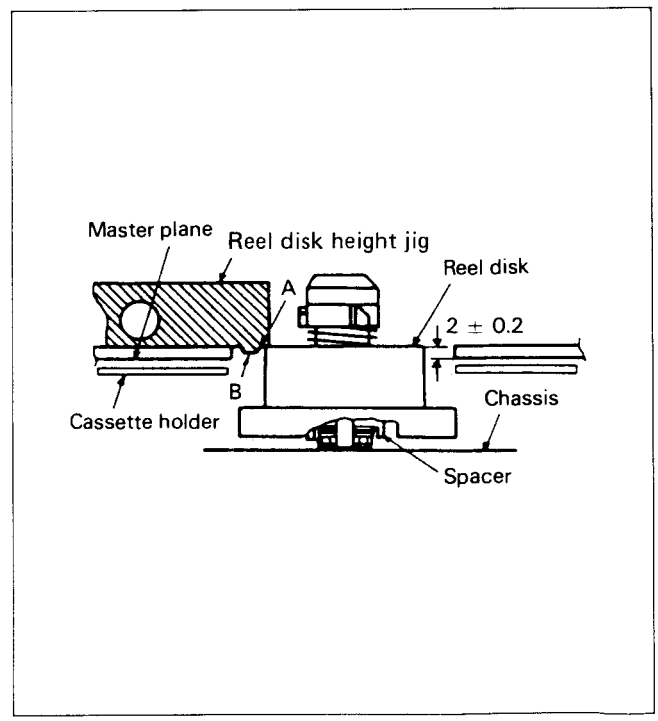


Fig. 2 Reel Disk

2. Tension pole position/tension adjustment

Adjust the tension pole position and tension, and confirm the position and tension.

Remove the top cover and cassette lid before adjustment.

Position adjustment

1) Cover the light-receiving port of the supply end sensor using paper, etc.
2) Press the play button without inserting a cassette to place the VTR in the loading mode.
3) Loosen the tension band bracket fixing screw, and put a flat tip screwdriver in the groove between the bracket and chassis.
4) Slide the tension band bracket with the screwdriver and set the spacing between the tension pole and chassis to 1 ~ 2 mm.
5) Tighten the bracket fixing screw.
6) Perform the loading operation without inserting a cassette after adjustment to check the tension pole position again.

Tension adjustment

1) Loosen the spring holder fixing screw.
2) Load the tension cassette and play it back in the SP mode.
3) Fit a flat head screwdriver to the spring holder and slide the holder.
4) Adjust the tension so that the reading of the meter is 32 – 38 g-cm.
5) Set the VTR to the STOP mode and tighten the screw.
6) Check the tension pole position again when the tension is changed greatly (by 5 g-cm or more). When it is drifted, readjust the tension pole position and tension.
7) Remove the cover from the sensor after adjustment.

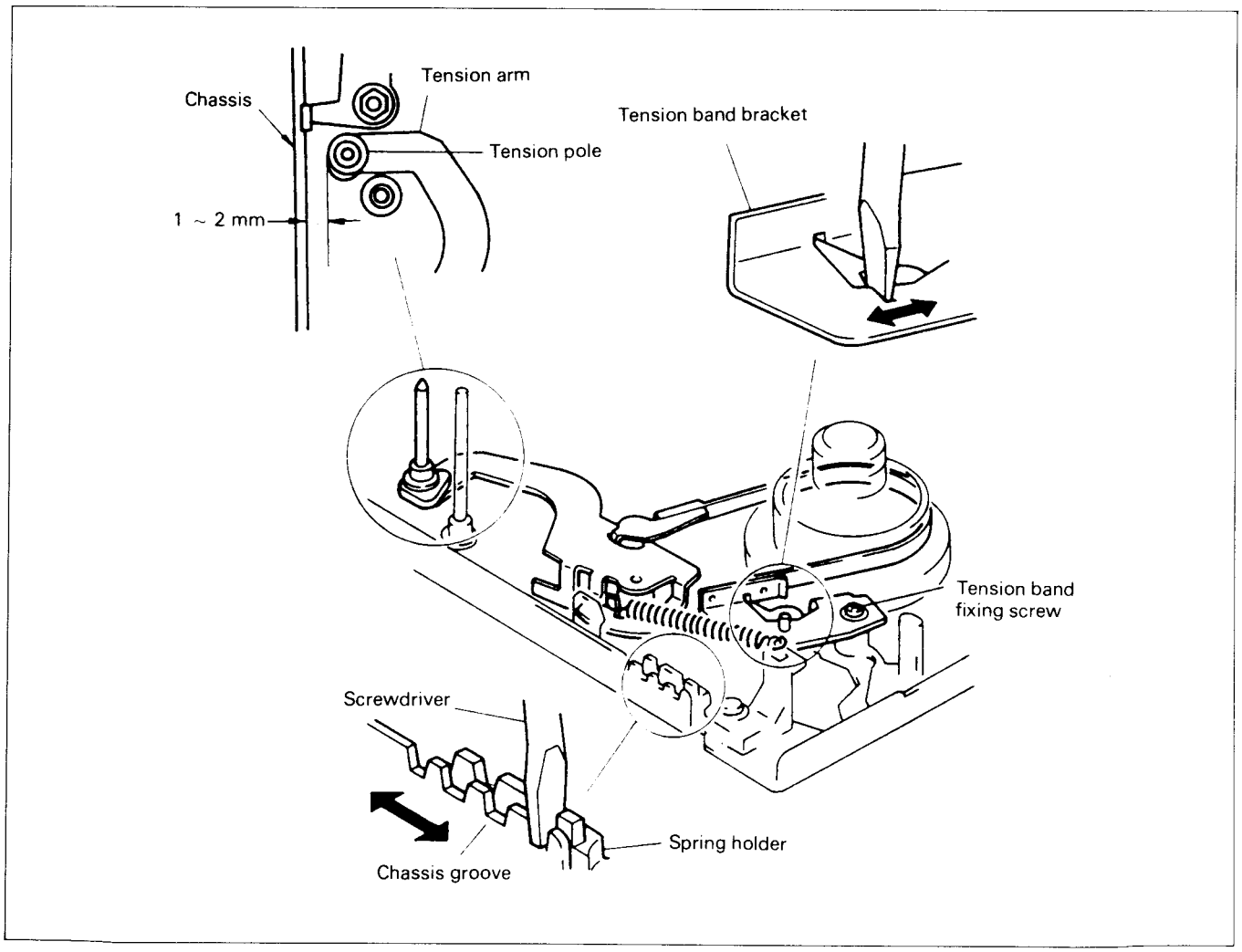


Fig. 3 Tension pole/tension band

3. Guide pole height adjustment

1) Remove the top cover and cassette lid, place the master plane on the cassette holder and lower the holder.
2) Place the reel disk height jig on the master plane and fit it to the guide pole.
3) Turn the guide pole height adjustment nut to adjust so that the gap between the upper flange of the guide pole and the top of the jig is 0.1 ± 0.1 mm.
4) Load a blank tape and run it to check that the tape does not ride over the top/bottom flanges.
5) When it rides over either flange, adjust the guide pole height. When the tape rides over the upper flange, turn the nut counterclockwise, and when the tape rides over the lower flange, turn the nut clockwise to lift or lower the guide pole.

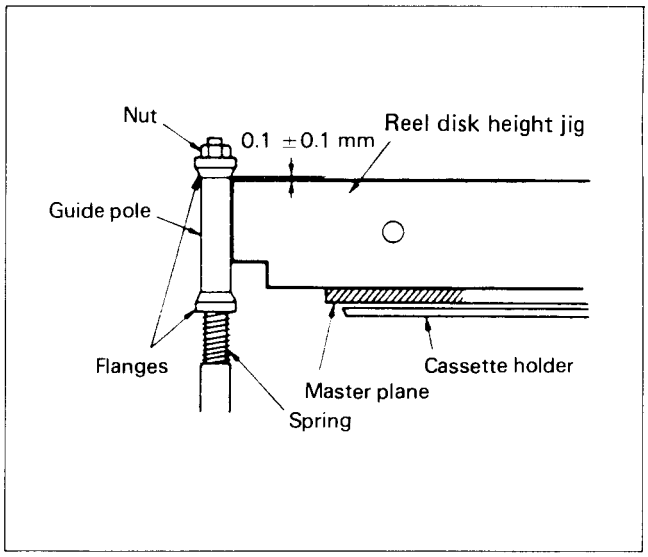


Fig. 4 Guide pole

4. Guide roller height adjustment

1) Remove the top cover and cassette lid, place the master plane on the cassette holder and lower the holder. Place the reel disk height jig on the master plane to fit it to the guide roller.
2) Tighten the guide roller fixing screw at the position where the upper flange of the guide roller and the top of the jig match.
3) Run the tape to check that the tape is not curled and does not rise, and then perform electrical adjustment.
4) Connect an oscilloscope to TP201 (FM output) on the Y/Chroma PC Board.
5) play back the colour bar test tape and set the tracking control to its click position.
6) Check that the FM waveform is flat.
7) Then, check that the FM drop at the leading and trailing edges are same when tracking control is turned to the left and right.
8) When it is not, loosen the guide roller fixing screw, turn the guide roller a little to the left and right to make it flat.
9) Tighten the fixing screw.

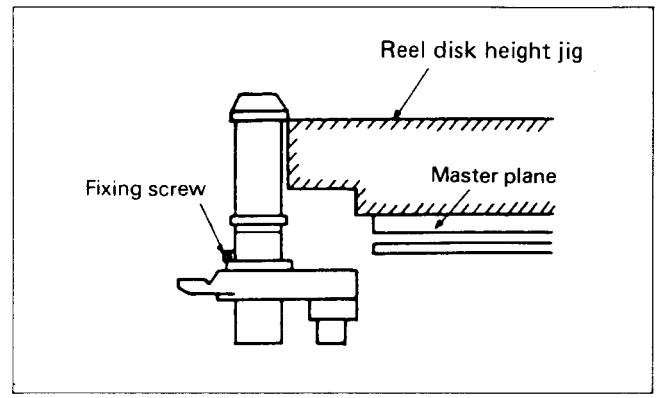


Fig. 5 Guide Roller

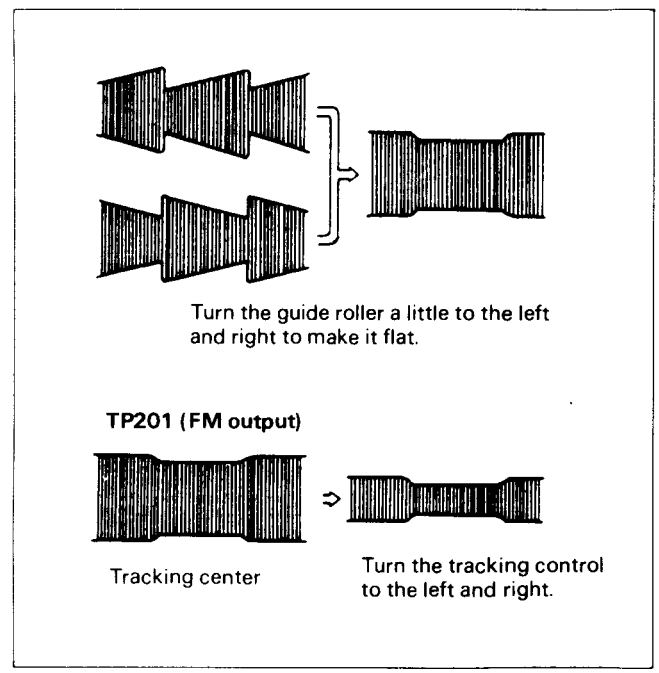


Fig. 6 FM Output

5. A/C head adjustment

With A/C head adjustment, the height, tilt and azimuth are adjusted before adjusting the X valuve; adjust the former 3 items repeatedly to determine the best A/C head installation position and then adjust the X value. The following shows the adjustment procedure when the A/C head is replaced. Be sure to perform coarse adjustment before precise adjustment.

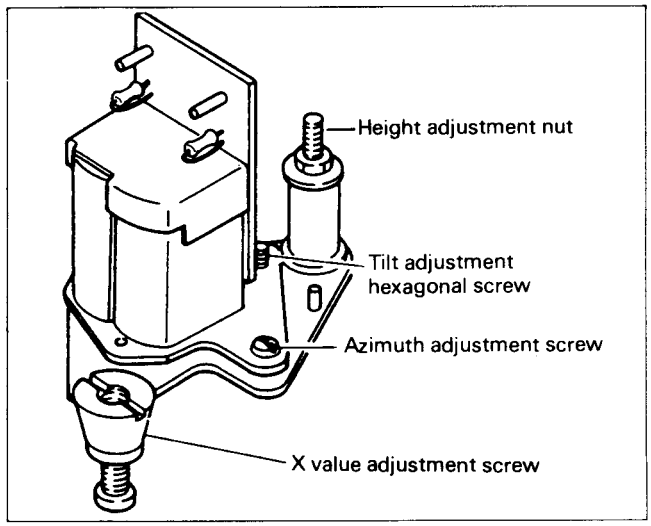


Fig. 7 A/C Head

Coarse adjustment

1) Tighten the A/C head fixing screw through the bottom of the head base (2) via the spring so that the top of the fixing screw comes out approx. 3 — 4 mm above the top of the head base (1). (Refer to Fig. 8.)
2) Adjust the tilt adjustment hexagonal screw and azimuth adjustment screw so that head base (1) is parallel with head base (2). (Refer to Fig. 8.)
3) Place the master plane on the cassette holder and lower the cassette holder.
4) Adjust the height adjustment nut so that the gap between the reel disk height jig and the shield case of the A/C head is approx. 0.5 mm when the right-angle guage is placed on the master plane and it is brought near to the A/C head. (Refer to Fig. 9.)
5) Remove the adjustment jigs, load a blank tape and set the VTR to the play mode. Check that extreme curling or rising does not occur near the A/C head at this time. When it happens, adjust the tile adjustment hexagonal screw, azimuth adjustment screw and the height adjustment nut again. With the best A/C head height, the bottom end of the tape is approx. 0.1 — 0.15 mm from the bottom of the control head core. (Refer to Fig. 10.)

Precise adjustment

6) Connect the L ch audio output and CH-1 of the oscilloscope, and connect the R ch audio output and CH-2.
7) Adjust playback level controls RT401 L, R described in the audio circuit adjustment for the maximum outputs.
8) Play back the audio 7 kHz signal on the alignment tape. Turn the adjustment screws for the tilt, azimuth and the AC head height alternately so the audio outputs from the both channels shown in Fig. 11 are maximum and the envelopes are flat and stable.
   When the audio output levels from the two channels differ, adjust the level to their average value.
9) Confirm that the phases of both channels match.
10) Perform the playback level adjustment described in the audio circuit adjustment.

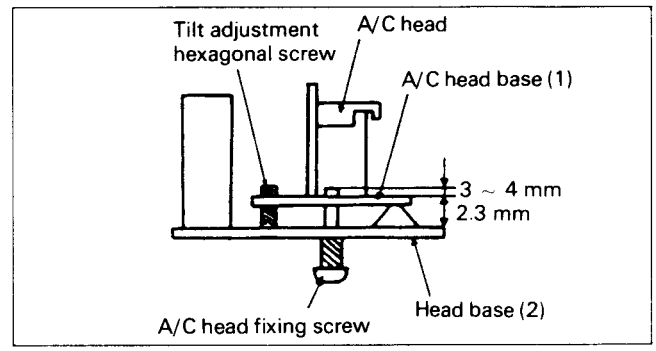


Fig. 8 Azimuth/Tilt Adjustments

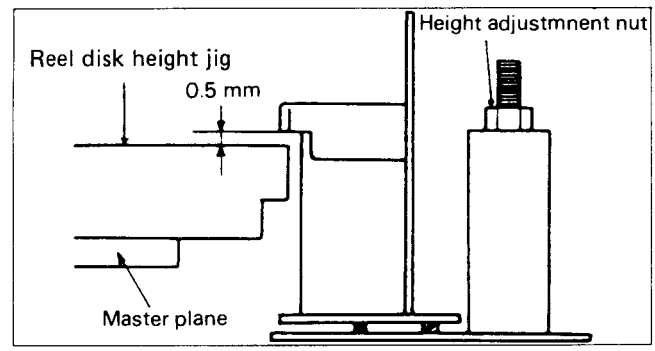


Fig. 9 Height Adjustment

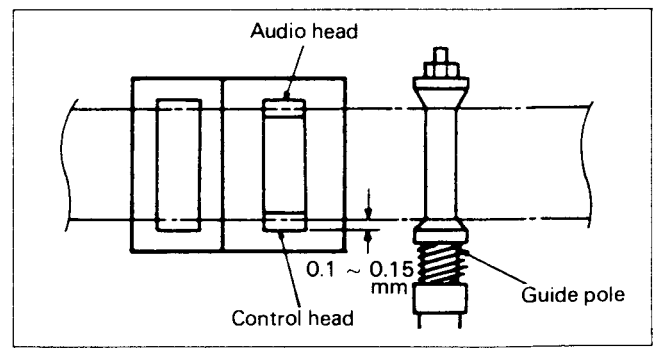


Fig. 10 Height Adjustment

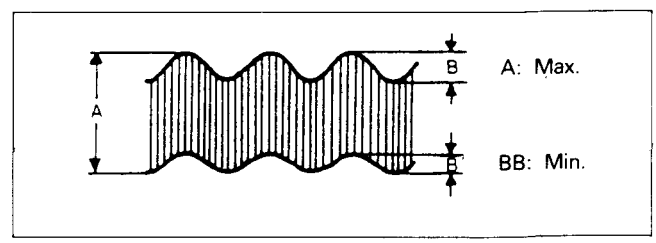


Fig. 11 Audio output

X value adjustment

11) Connect the oscilloscope to the FM output pin (TP201) of the Y/Chroma PC Board.
12) Connect a jumper between pins PG505-1, PG505-8 and PG505-9 on the servo circuit board to select the LP head.
13) Set the tracking control its center click position and adjust the X value adjusting screw so that the peak-to-peak value of the FM envelope is maximum.
    Fig. 12 shows the variation characteristics of the peak-to-peak value of the FM envelope with respect to the turning of the tracking control when the X value is optimized using an alignment tape.
14) Check item 8) again.
15) Apply locking paint to the tilt adjusting screw, azimuth adjusting screw, AC head height adjusting nut and X value adjusting screws.
16) Remove the jumper between pins PG505-1, PG505-8 and PG505-9.
17) Adjust the play output and recording bias level as described in "Circuit adjustment".

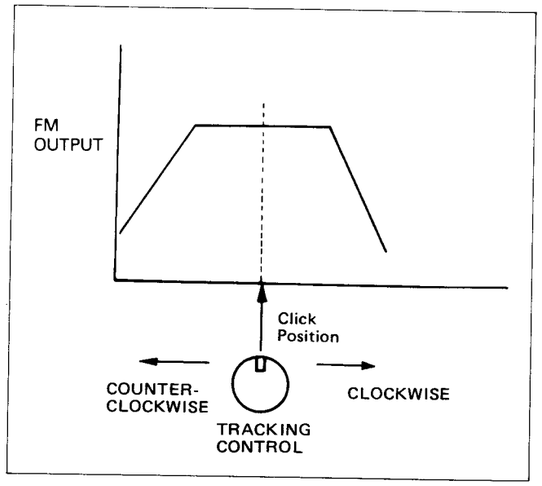


Fig. 12 X Value

6. Adjustment after replacing the cylinder (video heads)

When the cylinder is replaced, the relative height of the guide roller and the X value, etc. are drifted, so it is required to adjust the transport system and servo system.
However, when the cylinder has been replaced correctly, the drifts of the relative height and X value are very small, so it can be corrected by the electrical adjustment.

1) Check the curling or creasing of the tape does not occur near the guide roller.
   Adjust the height of the guide roller when they occur.
2) Perform the tracking preset adjustment. (Servo circuit)
3) Adjust the X value. (Refer to the item "A/C head adjustment".)
4) Check the flatness and level fluctuation of the FM output. The method to check this is described later.
5) Adjust the servo circuit and luminance/chroma circuit.

- **Switching point adjustment (Servo circuit)**
- **Record luminance/chroma level adjustment (Y/chroma circuit)**

3. Checking Tension/Torque

Checking the tension torque and compression strength at the tape take-up section and the movable section is important to smooth the tape transport and to satisfy the basic performance of the VTR.
When the tape transport is not smooth or when any abnormalities occur in the tape speed, the faulty section is detected by this check, replace it with good one then perform checking again to complete this job.

Item	VTR operation mode	Measured reel	Measurement value	Remarks
Pressure roller compression strength	PLAY-PAUSE	———	1.2 ± 0.2 kg	Note 1
Main brake torque	STOP	Supply & take-up reels	170 g-cm or more	Note 2
Slack removal torque	UNLOADING	Supply reel	200 ~ 300 g.cm	Note 2
F. FWD & Rewind torque	FAST-FORWARD & REWIND	Take-up & Supply reel	400 g.cm or more	Note 2
Take-up torque	PLAY	Take-up reel	100 ~ 150 g.cm	Note 2
Supply & take-up reels Back tension torque	F. FWD	Supply reel	4 ~ 15 g.cm	Note 3
	RWEIND	Take-up reel		

Note 1

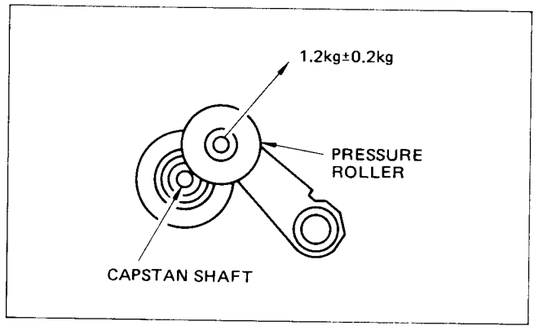


Fig. 13 Pressure Roller Compression Strength

Note 2: The value measured while sliding the torque gauge at the speed of 0.8 rps using the torque gauge and the torque gauge adaptor.
However, the main brake torque shows the value when measured while turning the take-up reel clockwise and the supply reel, counterclockwise by hand at the speed of 0.8 rps.

Note 3: The value measured while drawing the take-up reel disk counterclockwise and the supply reel disk counterclockwise and the supply reel disk, clockwise at the speed of 50 mm/s using the dummy reel and fan type tension gauge.

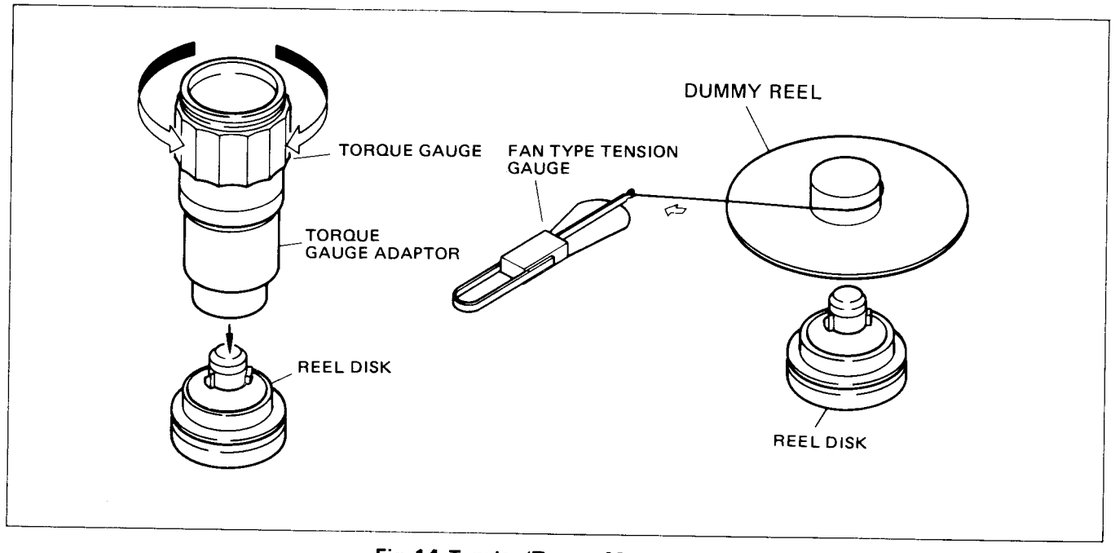
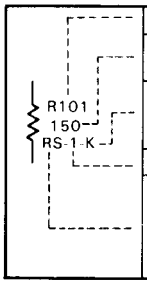


Fig. 14 Tension/Torque Measurement

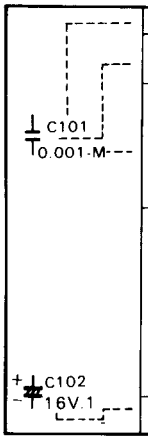
SCHEMATIC/CIRCUIT BOARD DIAGRAMS

Note

1. Voltage measured at base of chassis with minimum volume control and no signal.
   ( ) are shown in recording condition
2. Nomenclature of Resistors and Capacitors.



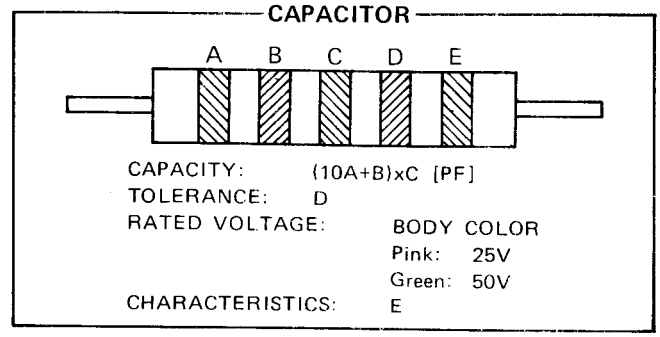
Circuit No.	
Value	No indicated Ω (Ohm) M : 1000kΩ
Tolerance	No indicated ± 5% K : ± 10% M : ± 20%
Wattage	No indicated ¼ W
Sort	No indicated Carbon film RC : Composition RW : Wire wound RS : Oxide metal film RN : Fixed metal film

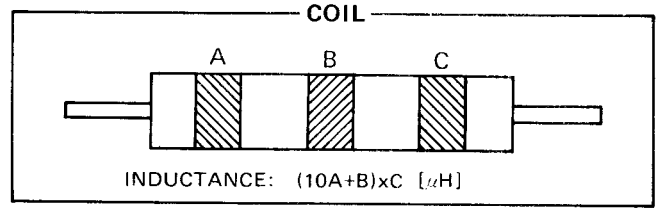


Circuit No.		
Value	No indicated μF P : PF	
Tolerance	No indicated ± 10% J : ± 5% M : ± 20% Z : + 80%, − 20% D : ± 0.5pF C : ± 0.25pF	
Sort		Ceramic
		Electrolitic
		Mylar
		Polyester
		Styrol
Voltage	No indicated 50WV	

3. Be sure to make your orders of resistors and capacitors with value, voltage, tolerance and sort.
4. When replacing capacitors marked With * use specified ones stated on parts list since required temperature characteristics.

HOW TO READ CAPACITY AND INDUCTANCE OF RESISTOR SHAPE CAPACITORS AND COILS

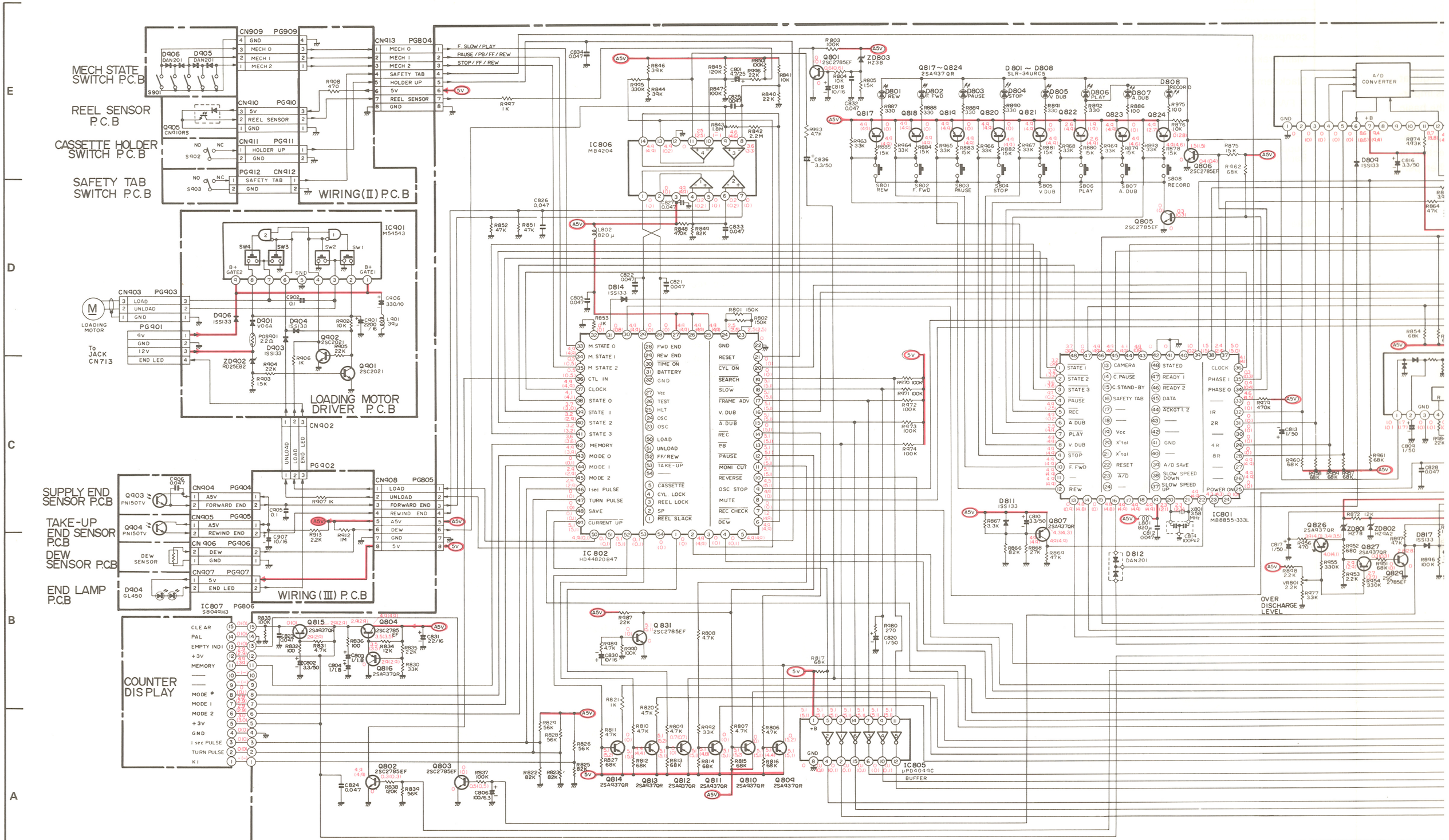




COLOR	A, B	C	D	E
Black	0	10^0	±20%	For temperature compensation
Brown	1	10^1		
Red	2	10^2		
Orange	3	10^3		
Yellow	4	10^4		
Green	5	10^5		
Blue	6			
Violet	7			
Grey	8		±30%	High dielectric constant type
White	9			For temperature compensation
Gold		10^{-1}	± 5%	
Silver		10^{-2}	±10%	High dielectric constant type

Cautions on use of MOS IC

1. The MOS IC is inserted in black foam for shipment. This foam is a conductor which short-circuits between the leads to prevent damage. Do not remove ICs from this foam during their storage. Avoid removing ICs from this foam, placing them on plastic which is likely to be charged with static electricity or inserting them into styrol foam.
2. High voltages may be applied during doldering caused by leakages from the soldering iron, so be sure to ground the tip of the soldering iron or use a low voltage soldering iron.
3. The human body, clothes made of synthetic fibres or nylon gloves may be charged with several thousands volts of static electricity because of friction, so a workers should be grounded.
4. Be sure to ground measuring instruments such as oscilloscopes, VTVMs, etc. used for repairs.

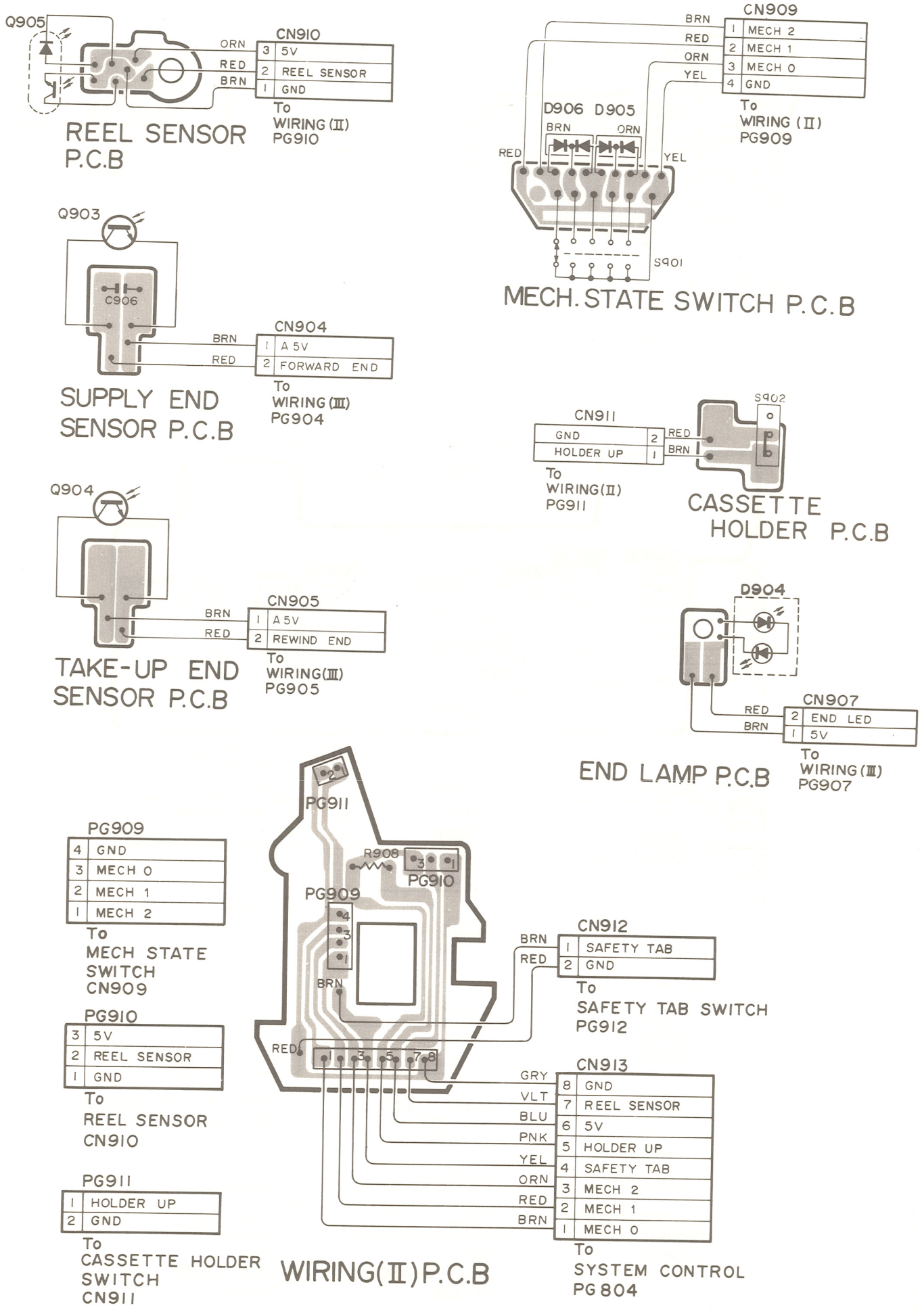


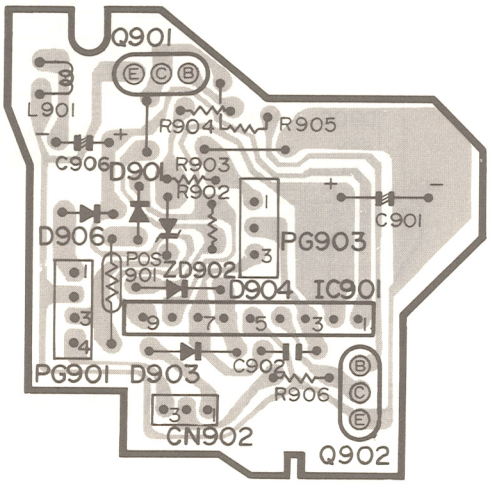
※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

SCHEMATIC DIAGRAM	PAGE
SYSTEM CONTROL	52
JACK	60
RF CONVERTER	63
CYLINDER MOTOR	63
REEL MOTOR	68
CAPSTAN MOTOR	69
SWITCH REGULATOR	70
SERVO	71
Y/CHROMA	81
AUDIO	88
V.S TUNING	92
MPX DEMODULATOR	96
SUB	100
TIMER/INPUT KEY	104
REGULATOR	108
REMORT CONTROL	112

SYSTEM CONTROL P.C.B

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.


Q905
ORN
RED
BRN
CN910
3 5V
2 REEL SENSOR
1 GND
To WIRING (II) PG910
REEL SENSOR P.C.B
CN909
BRN
RED
ORN
YEL
1 MECH 2
2 MECH 1
3 MECH 0
4 GND
To WIRING (II) PG909
D906 D905
BRN
ORN
RED
YEL
S901
MECH. STATE SWITCH P.C.B
Q903
C906
BRN
RED
CN904
1 A 5V
2 FORWARD END
To WIRING (III) PG904
SUPPLY END SENSOR P.C.B
CN911
GND 2
HOLDER UP 1
RED
BRN
To WIRING(II) PG911
S902
CASSETTE HOLDER P.C.B
Q904
BRN
RED
CN905
1 A 5V
2 REWIND END
To WIRING(III) PG905
TAKE-UP END SENSOR P.C.B
D904
CN907
RED
BRN
2 END LED
1 5V
To WIRING (III) PG907
END LAMP P.C.B
PG911
R908
PG910
PG909
BRN
RED
CN912
1 SAFETY TAB
2 GND
To SAFETY TAB SWITCH PG912
CN913
GRY 8 GND
VLT 7 REEL SENSOR
BLU 6 5V
PNK 5 HOLDER UP
YEL 4 SAFETY TAB
ORN 3 MECH 2
RED 2 MECH 1
BRN 1 MECH 0
To SYSTEM CONTROL PG804
PG909
4 GND
3 MECH 0
2 MECH 1
1 MECH 2
To MECH STATE SWITCH CN909
PG910
3 5V
2 REEL SENSOR
1 GND
To REEL SENSOR CN910
PG911
1 HOLDER UP
2 GND
To CASSETTE HOLDER SWITCH CN911
WIRING(II) P.C.B
A
B
C
D
E
1
2
3
4



PG901	
1	9V
2	GND
3	12V
4	END LED

To
JACK
CN 713

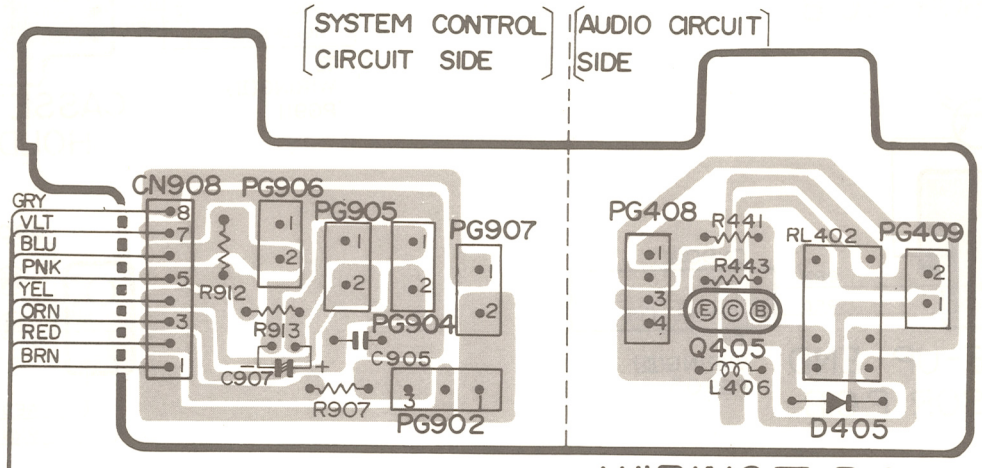
CN902	
1	UNLOAD
2	LOAD
3	END LED

To
WIRING(III)
PG 902

PG903	
1	GND
2	UNLOAD
3	LOAD

To
LOADING MOTOR
CN 903

LOADING MOTOR DRIVER P.C.B



WIRING III P.C.B

CN908		
BRN	1	LOAD
RED	2	UNLOAD
ORN	3	FORWARD END
YEL	4	REWIND END
PNK	5	A5V
BLU	6	DEW
VLT	7	GND
GRY	8	5V

To
SYSTEM
CONTROL
PG805

PG408	
1	9V
2	REC9V
3	RECORD
4	GND

To
AUDIO
CN401

PG409	
1	FULL ERASE
2	GND

To
FULL
ERASE
HEAD

PG902	
1	UNLOAD
2	LOAD
3	END LED

To
LOADING MOTOR
DRIVER
CN902

PG904	
1	A5V
2	FORWARD END

To
SUPPLY END
SENSOR
CN904

PG905	
1	A5V
2	REWIND END

To
TAKE-UP END SENSOR
CN905

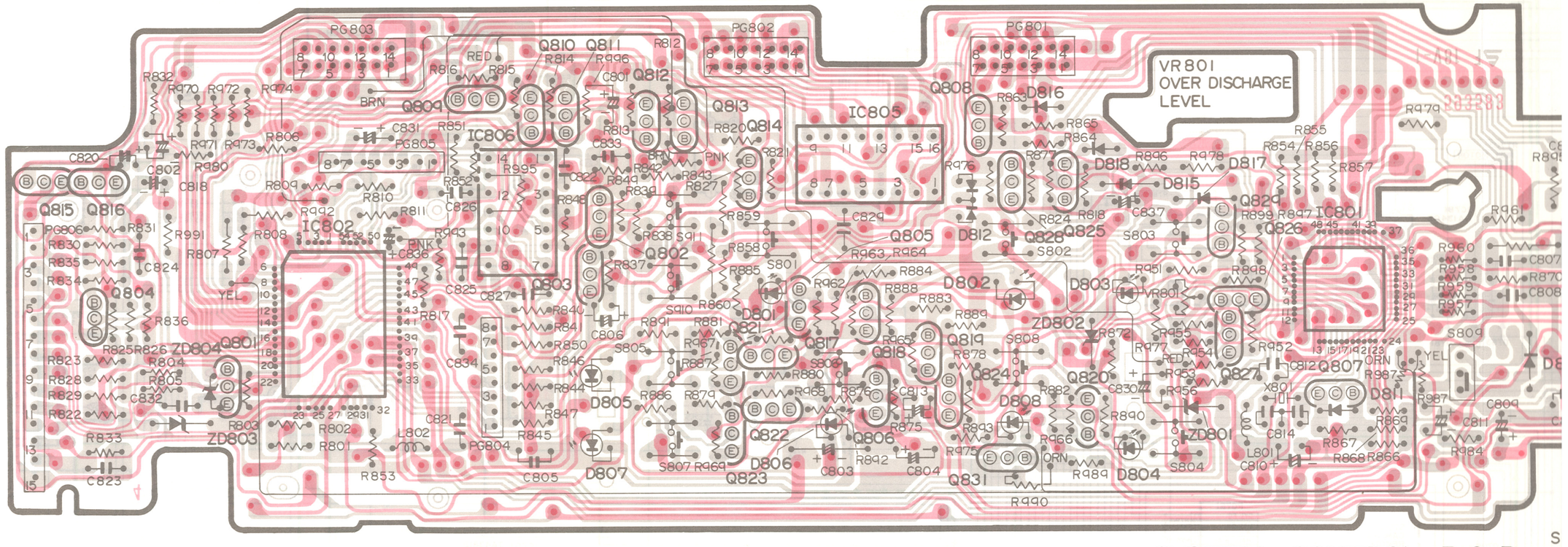
PG906	
1	GND
2	DEW

To
DEW SENSOR
CN906

PG907	
1	5V
2	END LED

To
END LAMP
CN907

S807 A.DUB
S801 REW
S802 F.FWD.
S910 REVERSE
S803 PAUSE
S805 V.DUB
S806 PLAY
S808 RECORD
S911 FRAME ADV.
S804 STOP



SYSTEM CONTROL P.C.B

Soldered side Parts side • Through hole

IC803

15	0 (0)	16	0.8(0.8)
13	3.7(3.7)	14	4.9(4.9)
11	—(—)	12	0 (0)
9	—(—)	10	0.3(0.3)
7	5.0 (5.0)	8	0.3 (0.3)
5	0.7 (0.7)	6	0 (0)
3	0 (0)	4	0 (0)
1	1.0(0)	2	1.7(1.7)

IC804

15	0 (0)	16	0 (0)
13	1.5(1.5)	14	0 (0)
11	8.7(8.8)	12	4.2(4.2)
9	—(—)	10	—(—)
7	9.4(9.4)	8	—(—)
5	0 (0)	6	8.6 (8.6)
3	0 (0)	4	0 (0)
1	0 (0)	2	0 (0)

IC806

14	4.9(4.9)	1	0 (0)
13	4.9(0.2)	2	0 (0)
12	0 (0)	3	4.9(4.9)
11	2.5(2.5)	4	0.2(0.2)
10	—(—)	5	0(0)
9	4.6(4.6)	6	0.2(0.2)
8	3.6(3.3)	7	0(0)

PG801

14	REMOTE GND
13	$\overline{\text{READY 2}}$
12	$\overline{\text{ACKGT}}$
11	DATA
10	C.STAND-BY
9	12 V
8	SLOW SPEED
7	$\overline{\text{READY 1}}$
6	TIME ON
5	$\overline{\text{R.POWER}}$
4	C.PAUSE
3	CAMERA
2	$\overline{\text{POWER SW ON}}$
1	REMOTE

To JACK CN710

PG802

14	NO TAB
13	FF/REW
12	REEL DRIVE
11	AC12V
10	PAUSE
9	LOAD
8	FRAME ADV
7	SLOW
6	SEARCH
5	CURRENT UP
4	A. DUB
3	PB
2	A5V
1	5V

To JACK CN709

PG803

14	MUTE
13	OSC STOP
12	DATE BACK-UP
11	GND
10	$\overline{\text{CYL ON}}$
9	V. DUB
8	$\overline{\text{REC CHECK}}$
7	$\overline{\text{CTL PULSE}}$
6	SP
5	CYL. LOCK
4	$\overline{\text{REVERSE}}$
3	SLACK REMOVE
2	REC
1	SAVE

To JACK CN708

PG804

8	GND
7	REEL SENSOR
6	5V
5	HOLDER UP
4	SAFETY TAB
3	MECH 2
2	MECH 1
1	MECH 0

To WIRING (II) CN913

PG805

1	LOAD
2	UNLOAD
3	FORWARD END
4	REWIND END
5	A 5V
6	DEW
7	GND
8	5V

To WIRING (III) CN908

Q801

B	0.6(0.6)
C	0 (0)
E	0 (0)

Q802

B	0.3(0.3)
C	4.9(4.9)
E	0 (0)

Q803

B	0.5 (0.5)
C	0 (0)
E	0 (0)

Q804

B	3.5(3.5)
C	4.9(4.9)
E	2.9(2.9)

Q805

B	0.3(0.3)
C	0 (0)
E	0 (0)

Q811

B	5.1(4.8)
C	0 (0)
E	5.1(5.1)

Q812

B	0 (0)
C	0.7(0.7)
E	5.1(5.1)

Q813

B	4.4(4.4)
C	5.1(5.2)
E	5.1(5.1)

Q814

B	5.1(5.2)
C	0 (0)
E	5.1(5.1)

Q815

B	2.9(2.9)
C	0 (0)
E	2.9(2.9)

Q821

B	4.9(4.9)
C	0 (0)
E	4.9(4.9)

Q822

B	2.6(4.9)
C	1.9(1.9)
E	2.6(4.9)

Q823

B	4.9(4.6)
C	0 (0)
E	4.9(4.9)

Q824

B	4.9(4.6)
C	0 (2.8)
E	4.9(2.7)

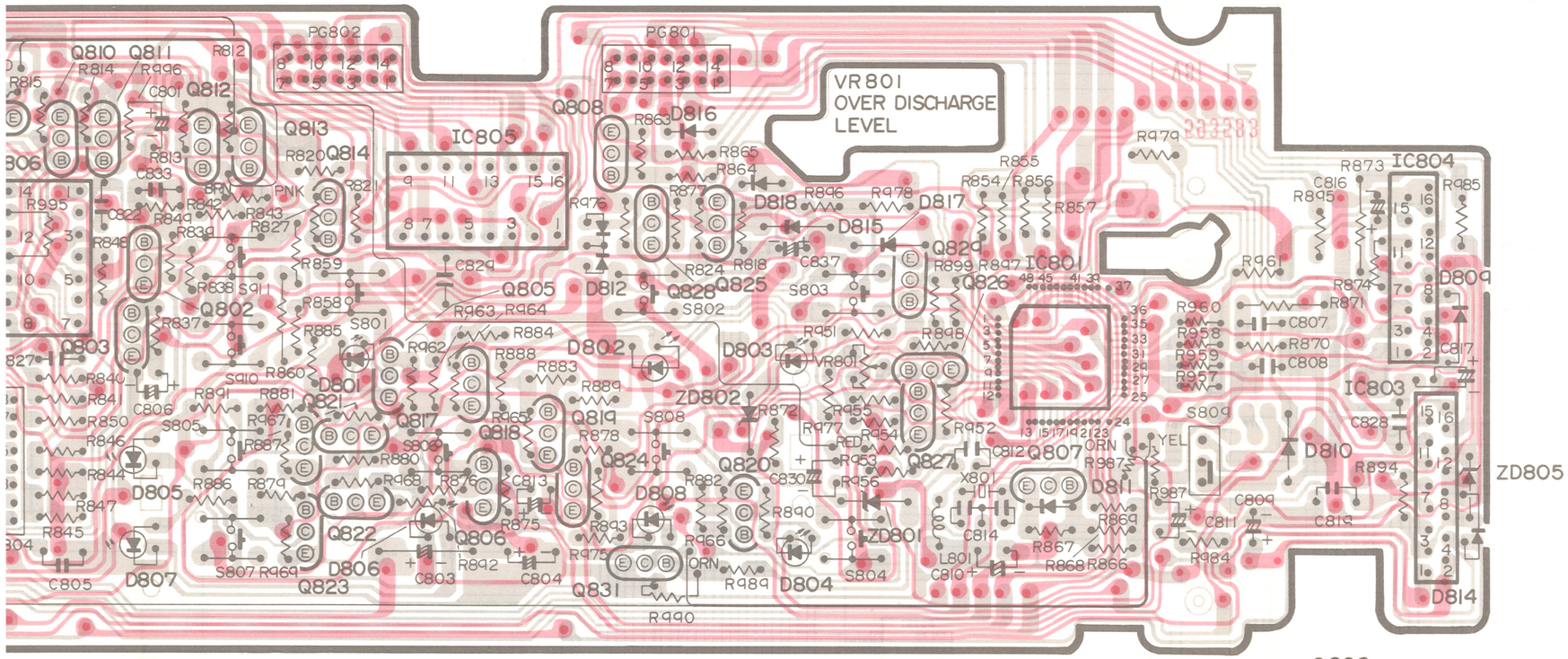
Q825

B	5.1(0.6)
C	8.4(0.1)
E	4.9 (0)

※VOLTAGES ARE MEASURED IN PL

S807 A.DUB | S801 REW | S802 F.FWD. | S910 REVERSE | S803 PAUSE

S805 V.DUB | S806 PLAY | S808 RECORD | S911 FRAME ADV. | S804 STOP



Parts side ● Through hole

SYSTEM CONTROL P.C.B

S809
OPERATE SW

IC801

1	3.2(2.9)	11	4.9(4.9)	21	2.3(2.3)	31	0(0)	41	0(0)
2	3.2(3.2)	12	4.9(4.9)	22	4.9(4.9)	32	0(0)	42	0(0.2)
3	3.6(3.6)	13	0(0.9)	23	4.3(4.3)	33	4.6(4.5)	43	4.9(0.9)
4	4.9(0.2)	14	4.8(4.8)	24	0(0)	34	0.4(0.4)	44	4.9(4.9)
5	4.9(2.5)	15	0(0)	25	0(0)	35	0.3(0.3)	45	4.9(4.9)
6	4.9(0.2)	16	4.8(4.8)	26	4.9(4.9)	36	4.1(4.1)	46	4.9(4.9)
7	2.5(4.9)	17	4.9(4.9)	27	4.9(4.9)	37	5.0(5.0)	47	0(0)
8	4.9(4.9)	18	4.9(4.9)	28	0(0)	38	2.4(2.4)	48	3.7(3.0)
9	4.9(4.9)	19	4.9(4.9)	29	0(0)	39	1.5(1.5)		
10	4.9(4.9)	20	2.3(2.1)	30	0(0)	40	1.0(0.2)		

IC802

1	0(0)	11	5.1(5.1)	21	0(0)	31	0(0.8)	41	3.6(3.6)	51	0.1(0.1)
2	4.9(4.9)	12	5.1(5.1)	22	0(0)	32	0(0)	42	4.9(3.9)	52	5.1(5.1)
3	0(0)	13	5.1(5.1)	23	2.5(2.5)	33	4.9(4.9)	43	0(0.1)	53	0.1(0.1)
4	0(0.1)	14	5.1(5.1)	24	2.5(2.5)	34	0.5(0.5)	44	2.9(2.9)	54	0(0)
5	4.9(4.9)	15	0(5.1)	25	4.9(4.9)	35	0.5(0.5)	45	2.9(2.9)		
6	4.9(4.9)	16	5.1(5.1)	26	4.9(4.9)	36	4.9(4.9)	46	0(0)		
7	1.2(4.9)	17	5.1(5.1)	27	4.9(4.9)	37	4.1(4.1)	47	0(0)		
8	0(0)	18	5.1(5.1)	28	0(0)	38	3.7(3.0)	48	0.1(0.1)		
9	4.9(0)	19	5.1(5.1)	29	0(0)	39	3.2(2.9)	49	5.1(5.1)		
10	4.5(5.1)	20	0(0)	30	4.9(4.9)	40	3.2(3.2)	50	4.9(0.1)		

IC805

9	10	11	12	13	14	15	16
5.1(5.1)	0(0)	5.1(5.1)	0.1(0.1)	—	5.1(5.1)	0.1(0.1)	0(0)
8	7	6	5	4	3	2	1
0(0.1)	5.1(5.1)	0.1(0.1)	5.1(5.1)	0.1(0.1)	5.1(5.1)	0(0.1)	5.1(5.1)

Q804

	SENSOR
	ER UP
	TY TAB
	12
	11
	10

NG(II)
3

PG805

1	LOAD
2	UNLOAD
3	FORWARD END
4	REWIND END
5	A 5V
6	DEW
7	GND
8	5V

To
WIRING(III)
CN908

Q801

B	0.6(0.6)
C	0(0)
E	0(0)

Q802

B	0.3(0.3)
C	4.9(4.9)
E	0(0)

Q803

B	0.5(0.5)
C	0(0)
E	0(0)

Q804

B	3.5(3.5)
C	4.9(4.9)
E	2.9(2.9)

Q805

B	0.3(0.3)
C	0(0)
E	0(0)

Q806

B	0.4(0.4)
C	1.5(1.5)
E	0(0)

Q807

B	4.9(4.9)
C	4.9(4.9)
E	4.3(4.3)

Q808

B	5.0(5.0)
C	2.4(2.4)
E	5.2(5.2)

Q809

B	5.1(4.4)
C	0(5.2)
E	5.1(5.1)

Q810

B	5.1(5.2)
C	0(0)
E	5.1(5.1)

Q811

B	5.1(4.8)
C	0(0)
E	5.1(5.1)

Q812

B	0(0)
C	0.7(0.7)
E	5.1(5.1)

Q813

B	4.4(4.4)
C	5.1(5.2)
E	5.1(5.1)

Q814

B	5.1(5.2)
C	0(0)
E	5.1(5.1)

Q815

B	2.9(2.9)
C	0(0)
E	2.9(2.9)

Q816

B	2.9(2.9)
C	0(0)
E	3.5(3.5)

Q817

B	4.9(4.9)
C	0(0)
E	4.9(4.9)

Q818

B	4.9(4.9)
C	0(0)
E	4.9(4.9)

Q819

B	4.9(4.9)
C	0(0)
E	4.9(4.9)

Q820

B	4.9(4.9)
C	0(0)
E	4.9(4.9)

Q821

B	4.9(4.9)
C	0(0)
E	4.9(4.9)

Q822

B	2.6(4.9)
C	1.9(1.9)
E	2.6(4.9)

Q823

B	4.9(4.6)
C	0(0)
E	4.9(4.9)

Q824

B	4.9(4.6)
C	0(2.8)
E	4.9(2.7)

Q825

B	5.1(0.6)
C	8.4(0.1)
E	4.9(0)

Q826

B	4.0(4.1)
C	3.9(4.0)
E	3.4(3.5)

Q827

B	2.7(2.7)
C	0.3(0.3)
E	2.9(2.9)

Q828

B	0.6(0.6)
C	0(0)
E	0(0)

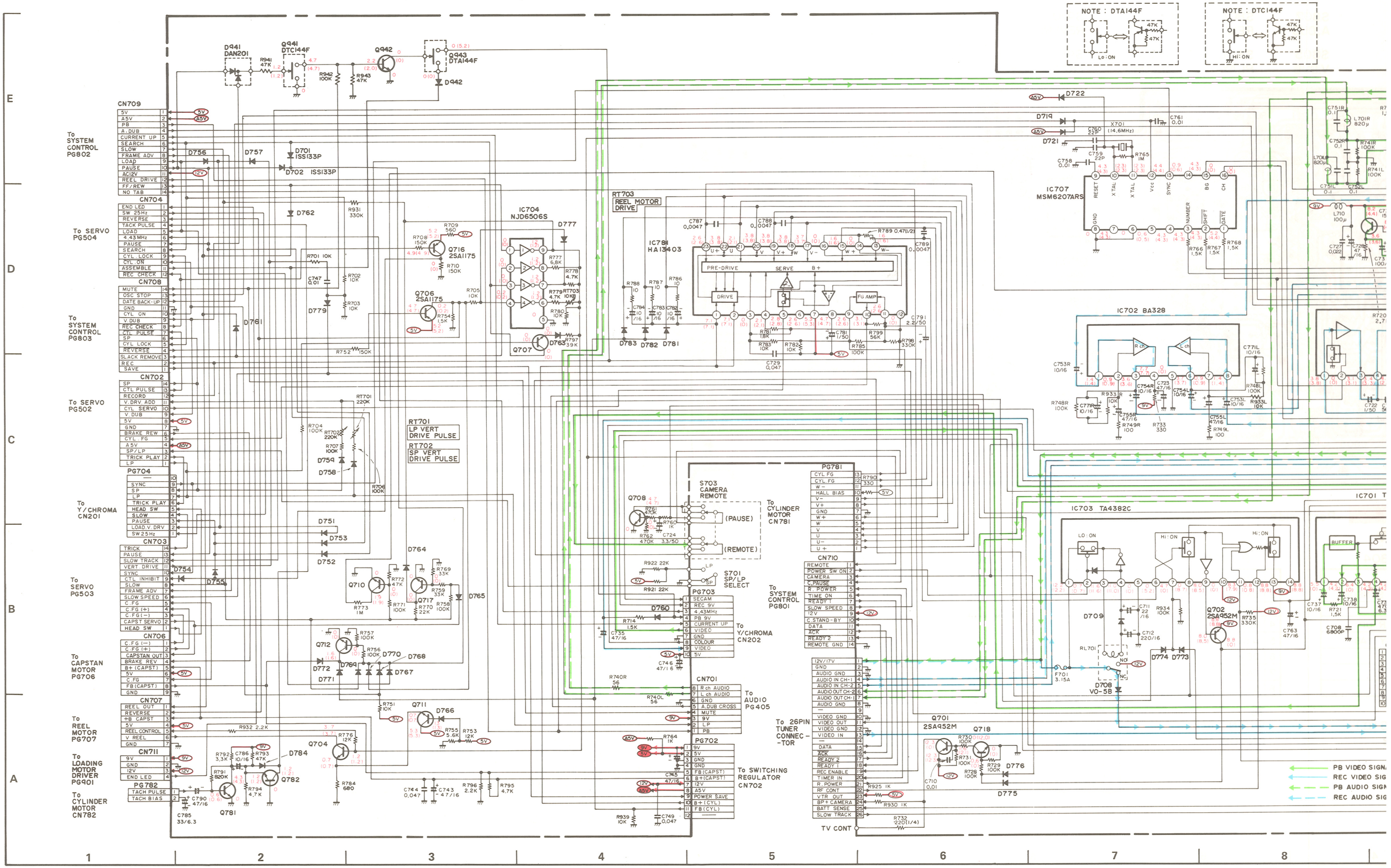
Q829

B	0(0)
C	2.8(2.8)
E	0(0)

Q831

B	0(0)
C	5.1(5.1)
E	0(0)

※VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN( ) ARE MEASURED IN RECORD MODE.


NOTE : DTA144F
NOTE : DTC144F
CN709
CN704
CN708
CN702
CN703
CN706
CN707
CN711
PG704
PG782
To SYSTEM CONTROL PG802
To SERVO PG504
To SYSTEM CONTROL PG803
To SERVO PG502
To Y/CHROMA CN201
To SERVO PG503
To CAPSTAN MOTOR PG706
To REEL MOTOR PG707
To LOADING MOTOR DRIVER PG901
To CYLINDER MOTOR CN782
IC704 NJD6506S
IC784 HA13403
RT703 REEL MOTOR DRIVE
RT701 LP VERT DRIVE PULSE
RT702 SP VERT DRIVE PULSE
S703 CAMERA REMOTE
S701 SP/LP SELECT
PG703
PG781
CN710
CN701
PG702
To CYLINDER MOTOR CN781
To SYSTEM CONTROL PG801
To Y/CHROMA CN202
To AUDIO PG405
To 26PIN TUNER CONNEC-TOR
To SWITCHING REGULATOR CN702
TV CONT
IC707 MSM6207ARS
IC702 BA328
IC703 TA4382C
PB VIDEO SIGN
REC VIDEO SIG
PB AUDIO SIGN
REC AUDIO SIG

SCHEMATIC DIAGRAM	PAGE	SCHEMATIC DIAGRAM	PAGE
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REEL MOTOR	68	SUB	100
CAPSTAN MOTOR	69	TIMER/INPUT KEY	104
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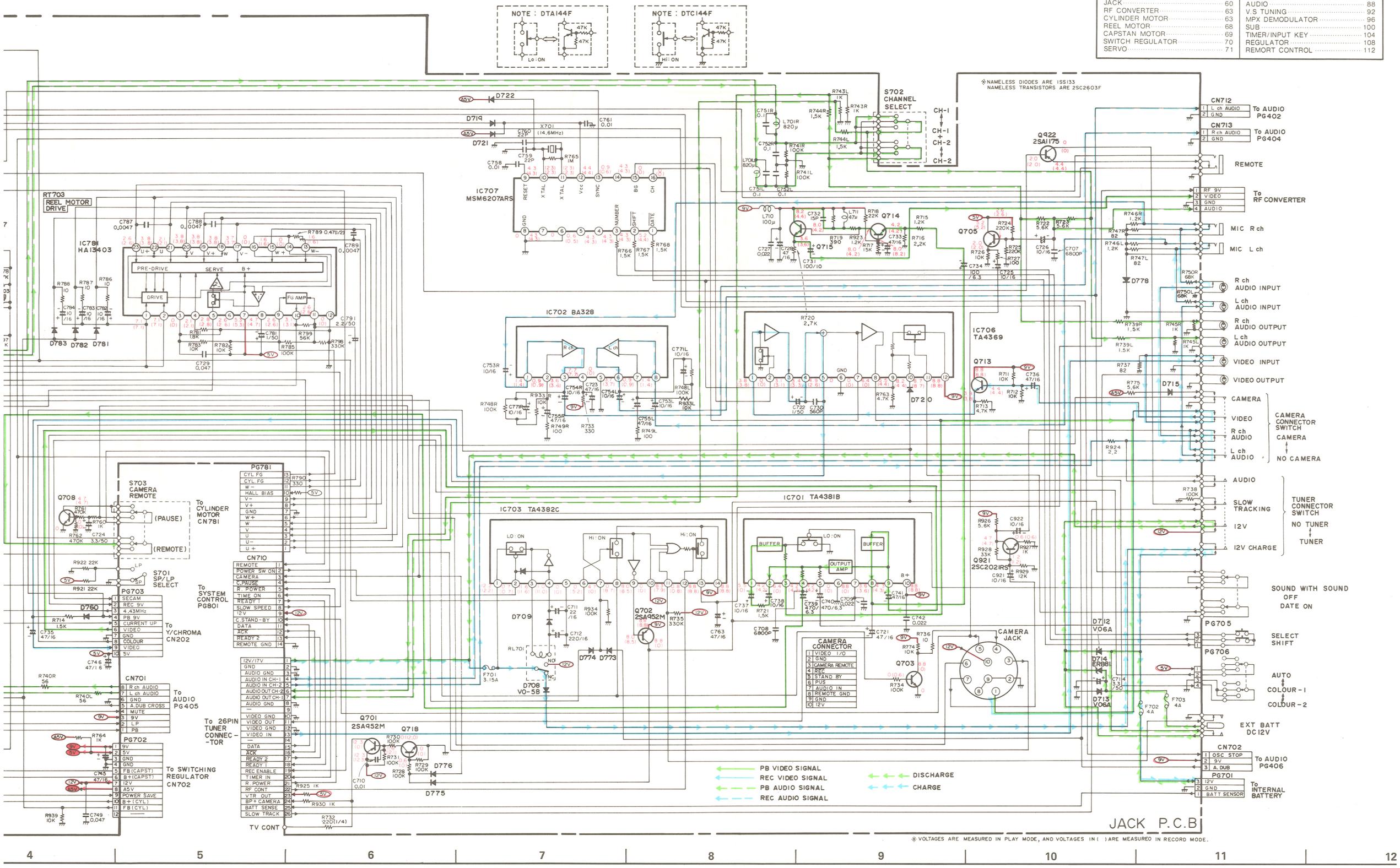
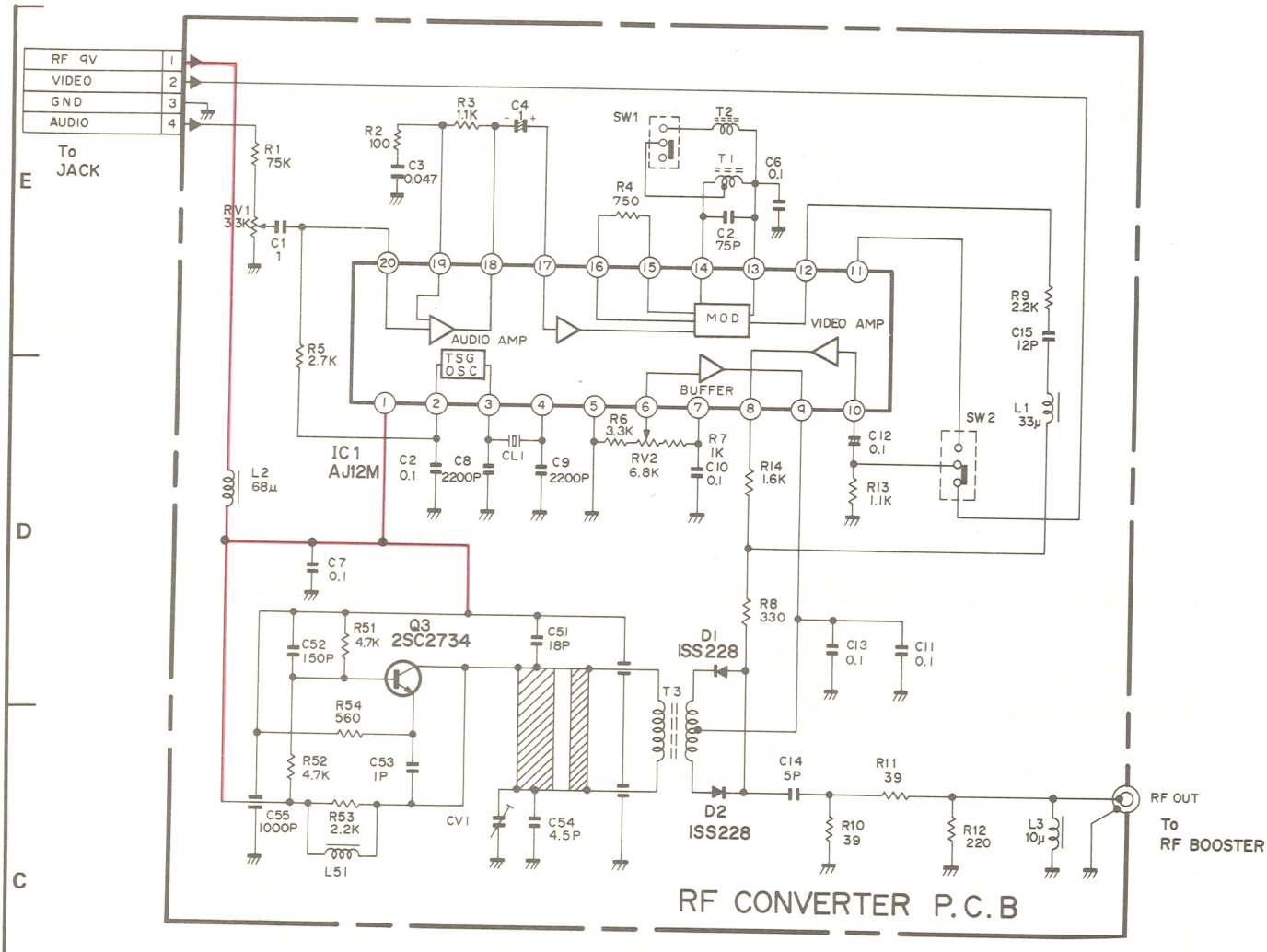
SERVO	71	REMORT CONTROL	112

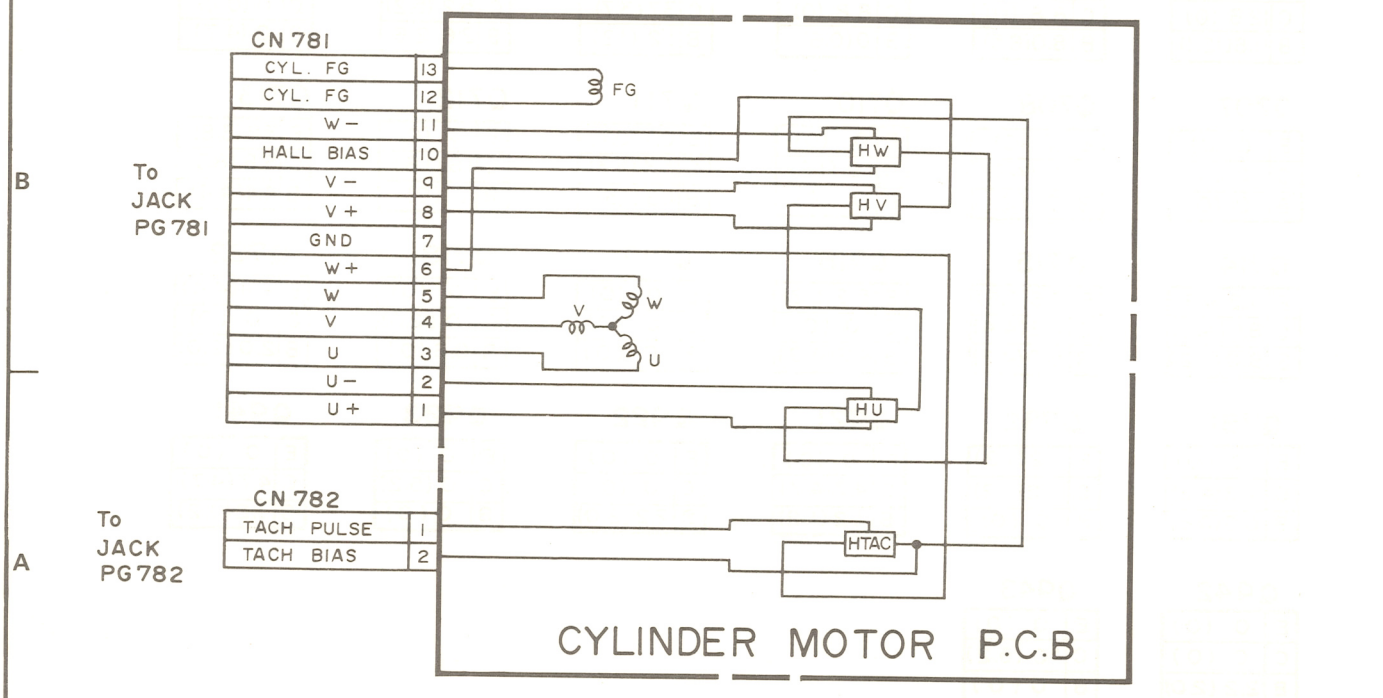


※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

RF CONVERTER



CYLINDER MOTOR



JACK CIRCUIT BOARD DIAGRAM

IC701

1	2	3	4	5	6	7	8	9	10
5.5 (0)	4.2 (4.2)	6.4 (0)	4.2 (4.2)	4.2 (4.2)	0 (0)	8.8 (0)	3.6 (3.6)	4.3 (4.3)	8.8 (8.8)

IC702

1	2	3	4	5	6	7	8
1.4 (1.4)	0.9 (0.9)	3.6 (3.6)	7.7 (7.7)	0 (0)	3.7 (3.7)	0.9 (0.9)	1.4 (1.4)

IC703

1	2	3	4	5	6	7	8	9	10	11	12	13	14
12.2 (12.2)	0.7 (0.7)	11.6 (11.6)	11.0 (11.0)	0 (0)	0 (5.2)	4.7 (0)	0 (8.7)	8.0 (8.5)	0 (0)	8.3 (7.9)	0.8 (0.8)	8.8 (8.8)	8.8 (8.8)

IC704

1	2	3	4	5	6	7	8	9
0 (0)	0 (0)	0 (0)	0.2 (0.2)	0 (0)	1.2 (1.2)	1.2 (1.2)	1.2 (1.2)	1.2 (1.2)

IC706

1	2	3	4	5	6	7	8	9	10	11	12
3.8 (3.8)	0 (0)	3.1 (3.1)	3.4 (3.3)	4.9 (2.6)	0 (0)	0 (0)	6.4 (0)	5.5 (4.4)	8.2 (4.4)	8.7 (8.7)	8.8 (8.8)

IC707

1	2	3	4	5	6	7	8
5.2 (4.4)	4.3 (4.3)	4.3 (4.3)	4.3 (4.3)	0.6 (0.5)	0 (0)	4.3 (4.3)	0 (0)
9	10	11	12	13	14	15	16
4.3 (4.3)	2.3 (2.3)	2.3 (2.3)	4.4 (4.4)	0.9 (0.6)	4.3 (4.3)	0 (0)	0 (0)

IC781

1	2	3	4	5	6	7	8	9	10	11	12
7.1 (7.1)	7.1 (7.1)	0 (0)	2.1 (2.1)	2.8 (2.8)	2.6 (2.6)	5.3 (5.3)	4.7 (4.7)	2.6 (2.6)	3.1 (3.1)	2.6 (2.6)	0 (0)
13	14	15	16	17	18	19	20	21	22	23	
1.6 (1.6)	0 (0)	1.6 (1.6)	0 (0)	3.7 (3.7)	3.8 (3.8)	3.8 (3.8)	3.8 (3.8)	2.7 (2.7)	3.8 (3.8)	2.6 (2.6)	

Q701

E	12.3 (12.3)
C	12.3 (0)
B	11.6 (12.1)

Q702

E	8.8 (8.8)
C	8.8 (0)
B	8.0 (8.5)

Q703

E	0 (0)
C	8.8 (0)
B	0 (0.6)

Q704

E	0.7 (0.7)
C	3.7 (3.7)
B	1.2 (1.2)

Q705

E	2.0 (2.0)
C	5.2 (5.2)
B	2.6 2.6

Q706

E	0 (5.2)
C	0 (0.2)
B	0 (4.7)

Q707

E	0 (0)
C	0 (0)
B	0 (0)

Q708

E	0 (0)
C	4.7 (4.7)
B	0 (0)

Q710

E	0 (0)
C	1.9 (1.9)
B	0 (0)

Q711

E	0.7 (0.7)
C	5.3 (5.3)
B	1.3 (1.3)

Q712

E	0 (0)
C	1.6 (1.6)
B	0 (0)

Q713

E	3.8 (3.8)
C	8.8 (8.8)
B	4.4 (4.4)

Q714

E	4.2 (4.2)
C	8.0 (4.2)
B	8.0 (8.2)

Q715

E	3.6 (3.6)
C	8.2 (4.4)
B	8.0 (4.2)

Q716

E	5.2 (5.2)
C	0 (0)
B	4.9 (4.9)

Q717

E	0 (0)
C	0 (0)
B	0 (0)

Q718

E	0 (0)
C	0 (12.0)
B	0.6 (0)

Q722

E	4.4 (4.4)
C	0 (0)
B	2.0 (2.0)

Q781

E	0 (0)
C	4.3 (4.3)
B	0.6 (0.6)

Q782

E	1.2 (1.2)
C	1.2 (1.2)
B	0 (0)

Q921

E	0 (0)
C	4.7 (4.7)
B	1.2 (1.2)

Q922

E	0 (0)
C	0 (0)
B	2.2 (2.0)

Q923

E	0 (0)
C	0 (5.2)
B	0 (0)

Q941

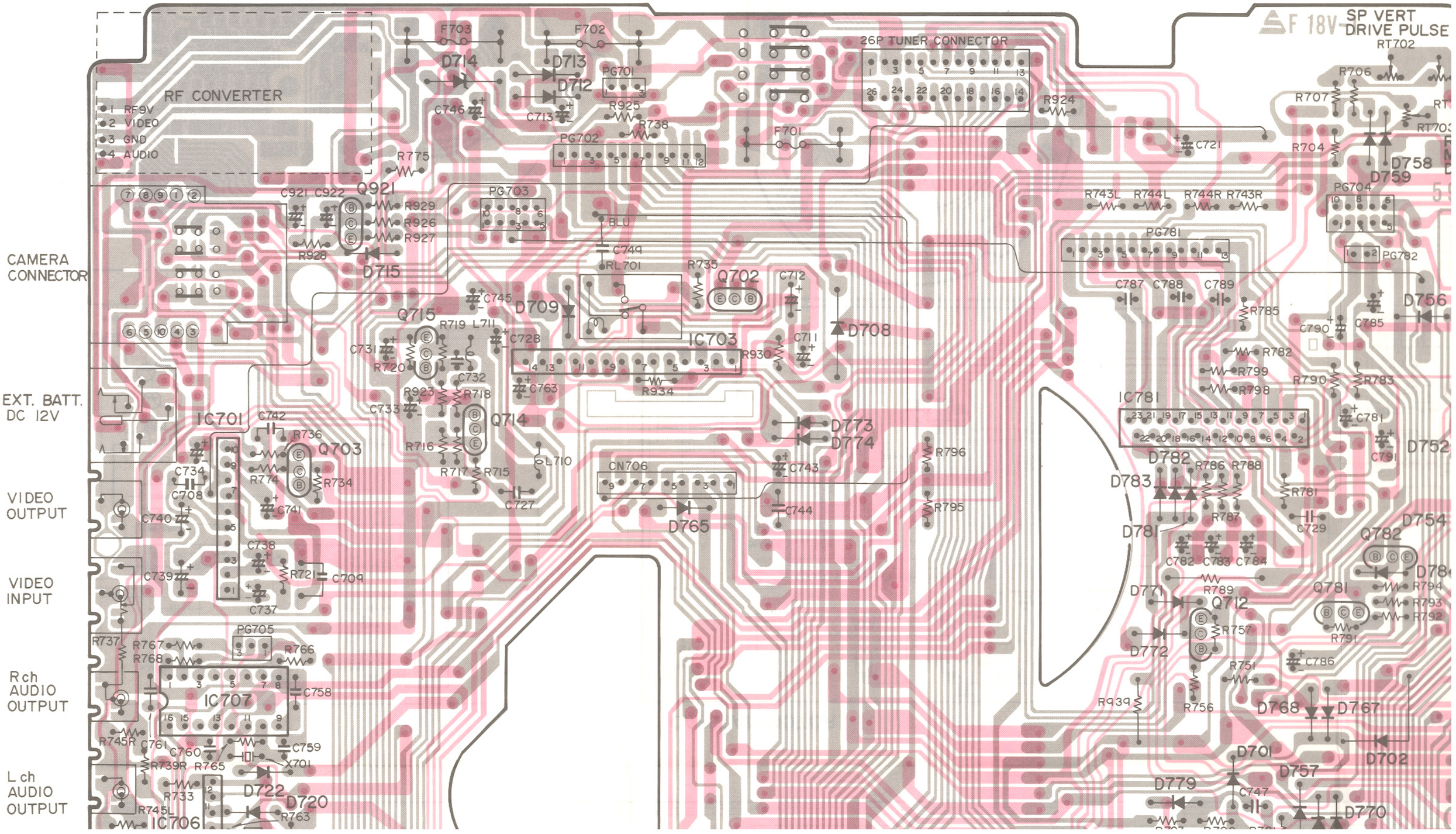
E	0 (0)
C	4.7 (4.7)
B	1.2 (1.2)

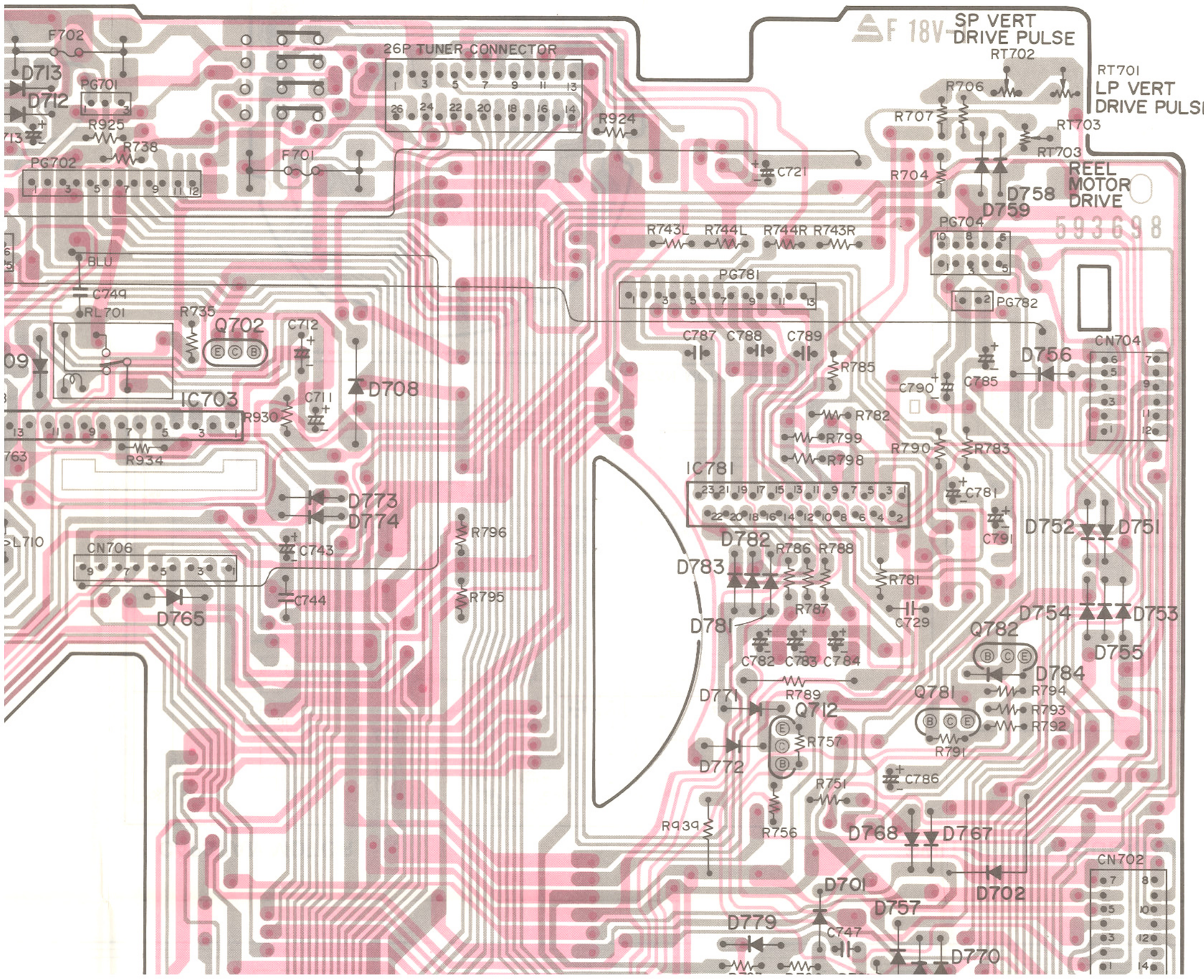
Q942

E	0 (0)
C	0 (0)
B	2.2 (2.0)

Q943

E	0 (0)
C	0 (5.2)
B	0 (0)


RF CONVERTER
1 RF9V
2 VIDEO
3 GND
4 AUDIO
CAMERA CONNECTOR
EXT. BATT. DC 12V
VIDEO OUTPUT
VIDEO INPUT
Rch AUDIO OUTPUT
Lch AUDIO OUTPUT
26P TUNER CONNECTOR
F 18V SP VERT DRIVE PULSE
F703
F702
D714
D713
D712
PG701
C746
C713
R925
R738
PG702
F701
R924
C721
RT702
R706
R707
RT703
R704
D758
D759
PG704
R775
C921 C922
Q921
R929
R926
R927
R928
D715
PG703
BLU
C749
RL701
R735
Q702
C712
D708
C745
D709
Q715
R719 L711
C728
C731
R720
C732
R923
R718
C733
Q714
R716
R717 R715
L710
C727
IC703
R930
R934
C763
D773
D774
C743
CN706
D765
C744
R796
R795
IC701
C742
R736
Q703
R774
R734
C734
C708
C740
C741
C738
C739
R721
C709
C737
PG705
R737
R767
R768
R766
IC707
C758
C761
C760
R739R
R765
C759
X701
R745R
R733
D722
D720
R763
IC706
R745L
R743L
R744L
R744R
R743R
PG781
PG782
C787
C788
C789
R785
C790
C785
D756
R782
R799
R798
R790
R783
IC781
C781
D752
D782
R786
R788
D783
R787
D781
R781
C729
D754
C782
C783
C784
Q782
D771
R789
Q712
R757
Q781
R794
R793
R792
R791
D772
C786
R751
R939
R756
D768
D767
D702
D701
D757
C747
D779
D770



CN701

1	PB
2	LP
3	9V
4	MUTE
5	A.DUB CROSS
6	GND
7	L ch AUDIO
8	R ch AUDIO

To AUDIO PG405

CN702

1	LP
2	TRICK PLAY
3	SP/LP
4	A5V
5	CYL.FG
6	BRAKE.REW
7	GND
8	5V
9	V.DUB
10	CYL. SERVO
11	V.DRV.ADD
12	RECORD
13	CTL PULSE
14	SP

To SEAVO PG502

CN707

1	REEL OUT
2	REVERSE
3	+B CAPST
4	5V
5	REEL CONTROL
6	V REEL
7	GND

To REEL MOTOR PG707

CN710

1	REMOTE
2	POWER SW ON
3	CAMERA
4	C.PAUSE
5	R.POWER
6	TIME ON
7	READY 1
8	SLOW SPEED
9	12V
10	C.STAND-BY

CN702

1	OSC STOP
2	9V
3	A.DUB

To AUDIO PG406

CN703

1	HEAD SW.
2	CAPST SERVO
3	C.FG(−)
4	C.FG(+)
5	C.FG
6	SLOW SPEED
7	FRAME ADV
8	SLOW
9	CTL INHIBIT
10	SYNC
11	VERT. DRIVE
12	SLOW TRACK
13	PAUSE
14	TRICK

To SERVO PG503

CN708

1	SAVE
2	REC
3	SLACK REMOVE
4	REVERSE
5	CYL LOCK
6	SP
7	CTL PULSE
8	REC CHECK
9	V.DUB
10	CYL ON
11	GND
12	DATE BACK-UP
13	OSC STOP
14	MUTE

To SYSTEM CONTROL PG803

CN711

1	9V
2	GND
3	12V
4	END LED

To LOADING MOTOR DRIVER PG901

CN704

1	END LED
2	SW 25Hz
3	REVERSE
4	TACH PULSE
5	LOAD
6	4.43MHz
7	PAUSE
8	SEARCH
9	CYL. LOCK
10	CYL. ON
11	ASSEMBLE
12	REC CHECK

To SERVO PG504

CN706

1	C.FG(−)
2	C.FG(+)
3	CAPSTAN OUT
4	BRAKE REV
5	B+ (CAPST)
6	5V
7	C.FG
8	FB (CAPST)
9	MOTOR

To CAPSTAN MOTOR PG706

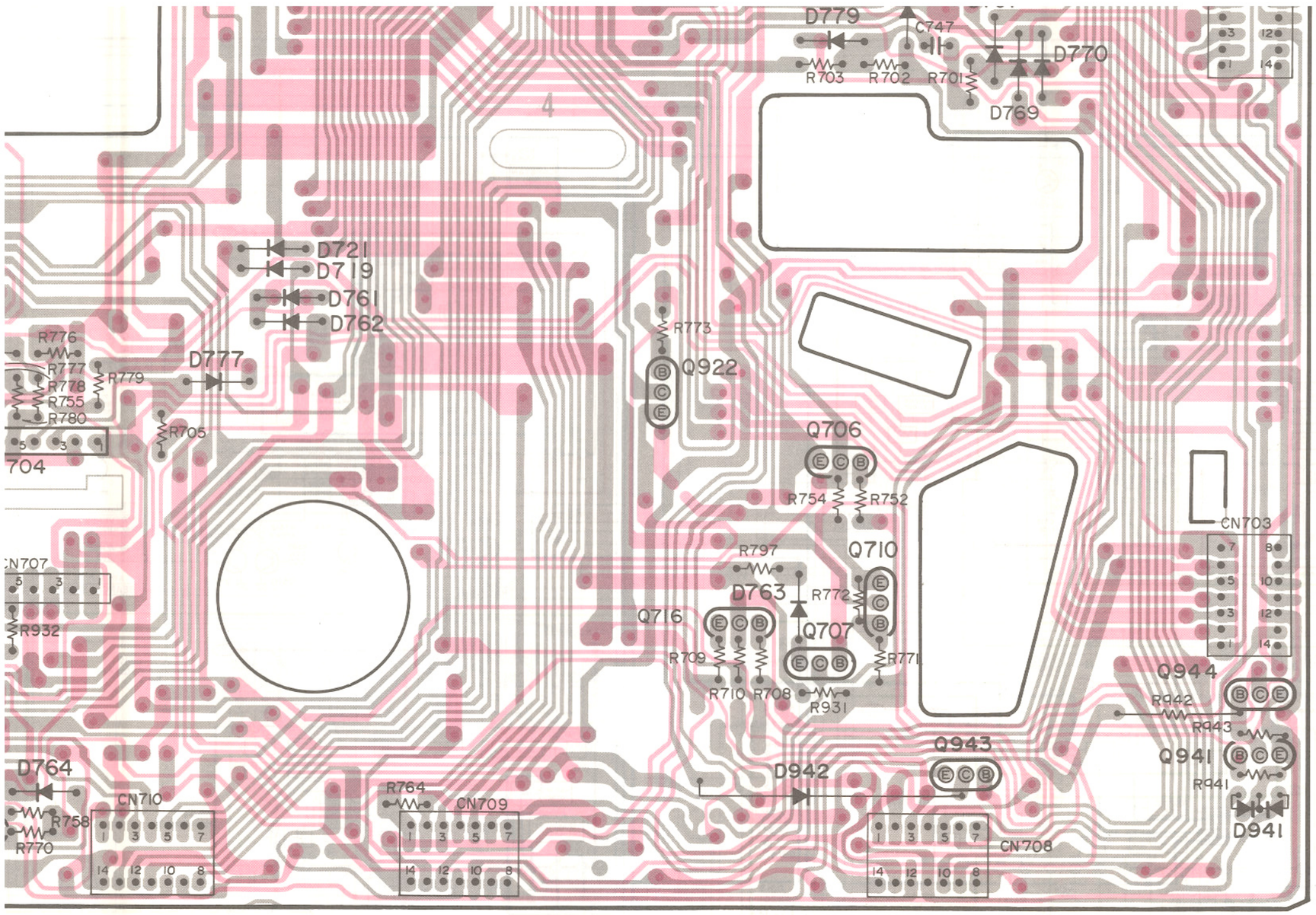
CN709

1	5V
2	A5V
3	PB
4	A.DUB
5	CURRENT UP
6	SEARCH
7	SLOW
8	FRAME ADV
9	LOAD
10	PAUSE
11	AC12V
12	REEL DRIVE
13	FF/REW
14	NO TAB

To SYSTEM CONTROL PG802

CN713

1	Rch AUDIO
2	GND



JACK P.C.B

6	TIME ON
7	READY 1
8	SLOW SPEED
9	12V
10	C.STAND-BY
11	DATA
12	ACK
13	READY 2
14	REMOTE GND

To SYSTEM CONTROL PG801

PG701

1	BATT. SENSOR
2	GND
3	12V

INTERNAL BATTERY

PG703

1	SECAM
2	REC 9V
3	4.43MHz
4	PB 9V
5	CURRENT UP
6	VIDEO
7	GND
8	COLOUR
9	VIDEO
10	5V

To Y/CHROMA CN202

PG781

1	U+
2	U−
3	U
4	V
5	W
6	W+
7	GND
8	V+
9	V−
10	HALL BIAS
11	W−
12	CYL FG
13	CYL FG

To CYLINDER MOTOR CN781

LOADING MOTOR DRIVER PG901

CN712

1	Lch AUDIO
2	GND

To AUDIO PG402

PG702

1	9V
2	5V
3	GND
4	GND
5	FB (CAPST)
6	B+ (CAPST)
7	12V
8	A5V
9	POWER SAVE
10	B+ (CYL)
11	FB (CYL)
12	—

To SWITCHING REGULATOR CN702

PG704

1	SW 25Hz
2	LOAD. V. DRV
3	PAUSE
4	SLOW
5	HEAD SW
6	TRICK PLAY
7	LP
8	SP
9	SYNC
10	—

To Y/CHROMA CN201

CN713

1	Rch AUDIO
2	GND

To AUDIO PG404

1	12V/17V
2	GND
3	AUDIO GND
4	AUDIO IN CH-1
5	AUDIO IN CH-2
6	AUDIO OUT CH-1
7	AUDIO OUT CH-2
8	AUDIO GND
9	—
10	VIDEO GND
11	VIDEO OUT
12	VIDEO GND
13	VIDEO IN
14	—
15	DATA
16	ACK
17	READY 2
18	READY 1
19	REC ENABLE
20	TIMER IN
21	R. POWER
22	RP CONT
23	VTR OUT
24	BP+ CAMERA
25	BATT SENSE
26	SLOW TRACK

To 26PIN TUNER CONNECTOR

PG782

1	TACH PULSE
2	TACH BIAS

To CYLINDER MOTOR CN782

Soldered side

Parts side

• Through-hole

4 5 6 7 8 9 10 11 12

JACK 65 66 JACK JACK 67

AUDIO OUTPUT

R ch AUDIO INPUT

L ch AUDIO INPUT

R ch MIC

L ch MIC

REMOTE

SOUND WITH SOUND

IC706 R745L R739L R750R R722 R750L R723 R733 D722 D720 R763 D760 R714 CN711 C735 C730 R711 Q713 C722 R713 R712 C726 C707 C736 CN702 C754R R749R IC702 CN713 R747R C753R C755R R933R C771R C723 R748R R746R R746L R748L C755L R933L C771L C754L C710 R749L CN712 C753L R747L R740R R740L L701L CN701 PG706 Q704 Q711 R753 D766 R776 R777 R778 R779 R755 R780 R784 IC704 D777 R705 D721 D719 D761 D762 R773 Q922 D779 C747 R703 R702 R701 D770 D769 Q706 R754 R752 Q710 R797 D763 R772 Q707 Q716 R709 R710 R708 R931 R771 D778 Q701 R730 R732 R731 R729 R728 C751R L701R C751L Q718 R725 R724 R726 C752R R741R R741L C752L R727 C725 Q705 REMOTE ↔ PAUSE D776 D775 S703 CAMERA REMOTE Q708 R760 R761 R762 C724 R921 R922 S701 LP↔SP S702 Q717 R759 R769 D764 R758 R770 CN710 CN707 R932 R764 CN709 D942 Q943 CN708

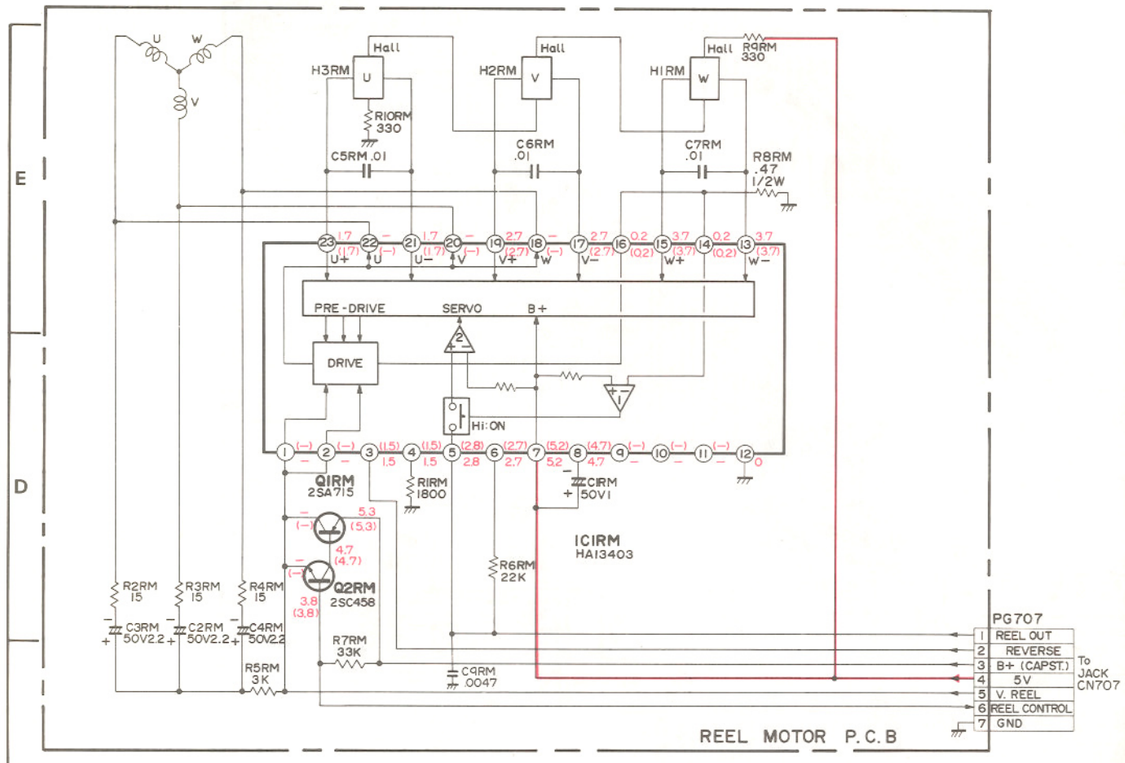
AUDIO SELECT
CH-2↔CH-1+CH-2↔CH-1

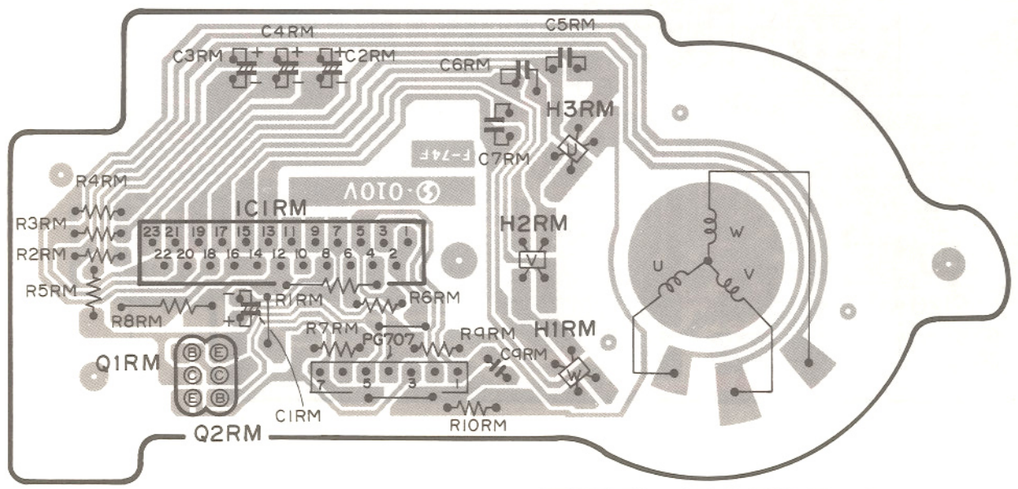
JACK

1 2 3 4 5 6 7 8

JACK 65 66 JACK

REEL MOTOR



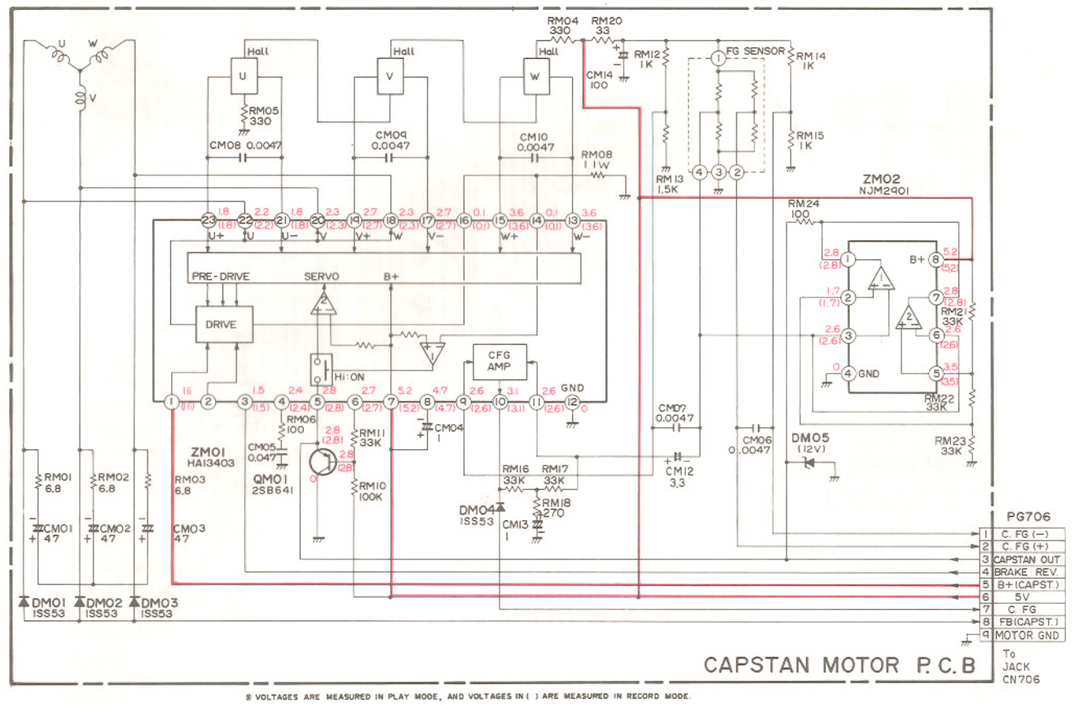


PG707

1	REEL OUT
2	REVERSE
3	B+ (CAPST.)
4	5V
5	V. REEL
6	REEL CONTROL
7	GND

To JACK CN707

CAPSTAN MOTOR



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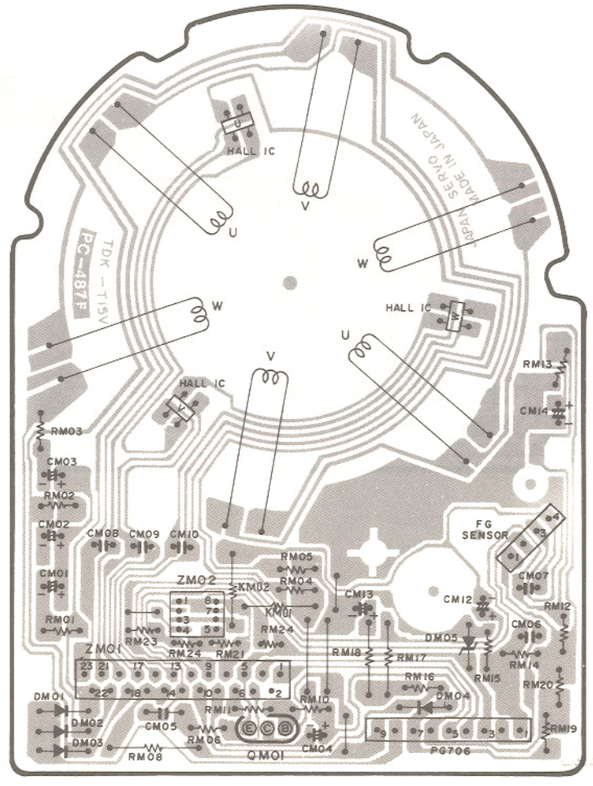


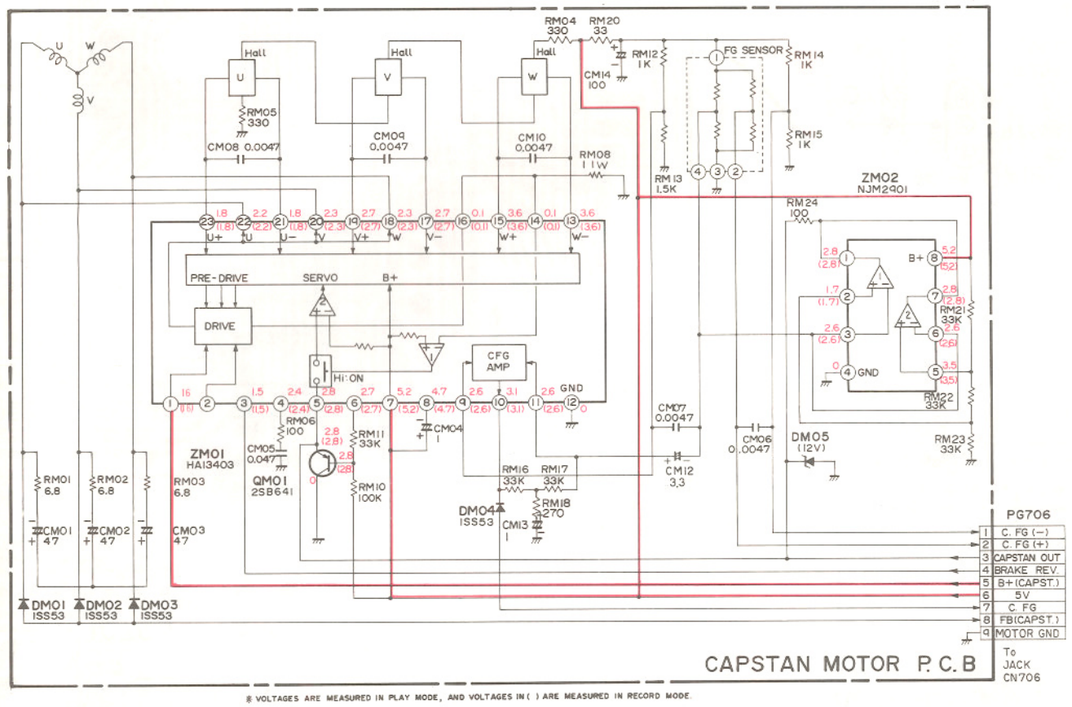
PG706

1	C. FG (−)
2	C. FG (+)
3	CAPSTAN OUT
4	BRAKE REV.
5	B+ (CAPST.)
6	5V
7	C. FG
8	FB (CAPST.)
9	MOTOR GND

To JACK CN706

CAPSTAN MOTOR P. C. B

CAPSTAN MOTOR



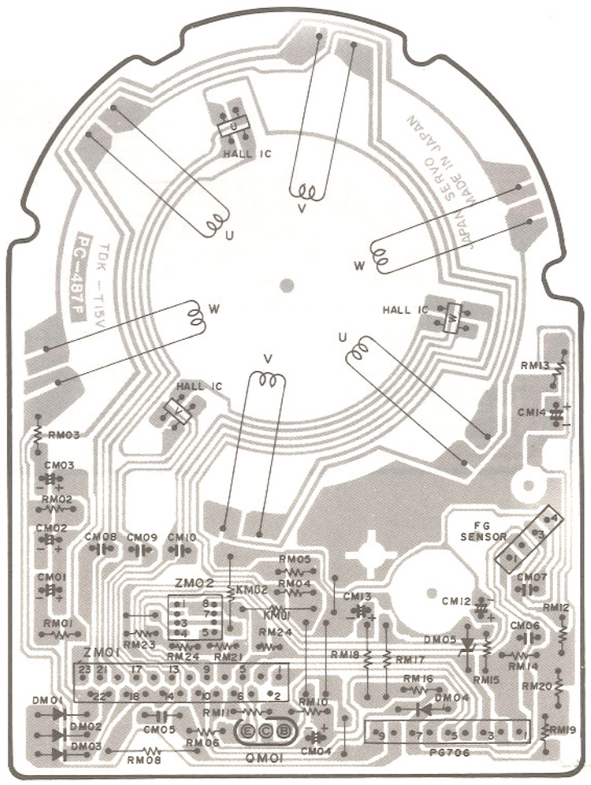
CAPSTAN MOTOR P. C. B

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

PG707

REEL OUT
REVERSE
B+ (CAPST.)
5V
V. REEL
REEL CONTROL
GND

To JACK CN707

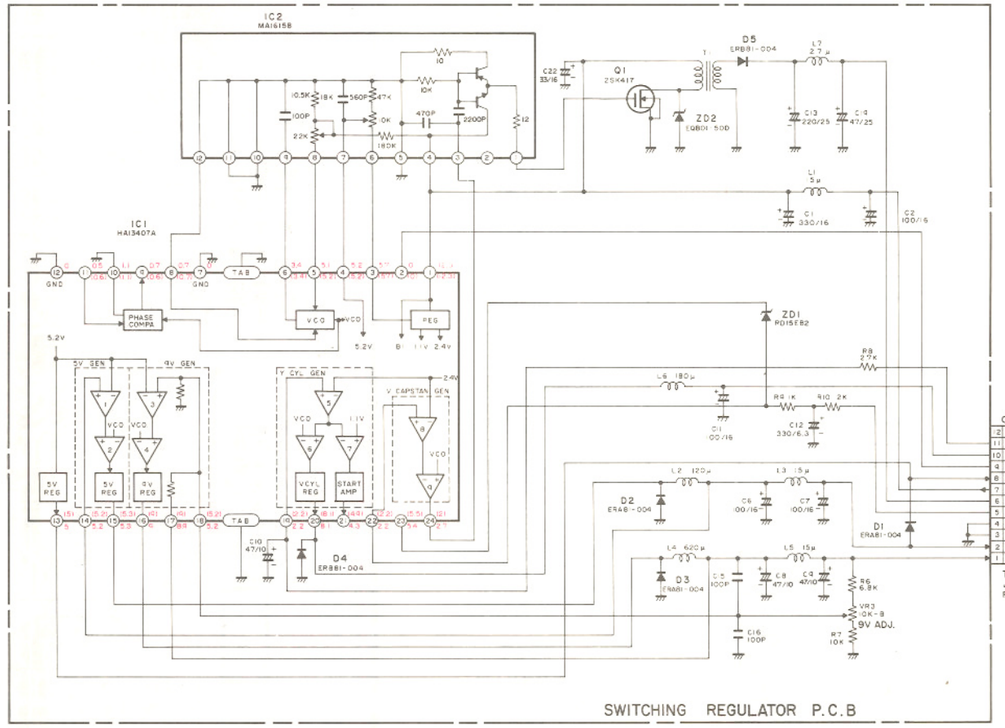


PG706

1	C. FG (−)
2	C. FG (+)
3	CAPSTAN OUT
4	BRAKE REV.
5	B+ (CAPST.)
6	5V
7	C. FG
8	FB (CAPST.)
9	MOTOR GND

To JACK CN706

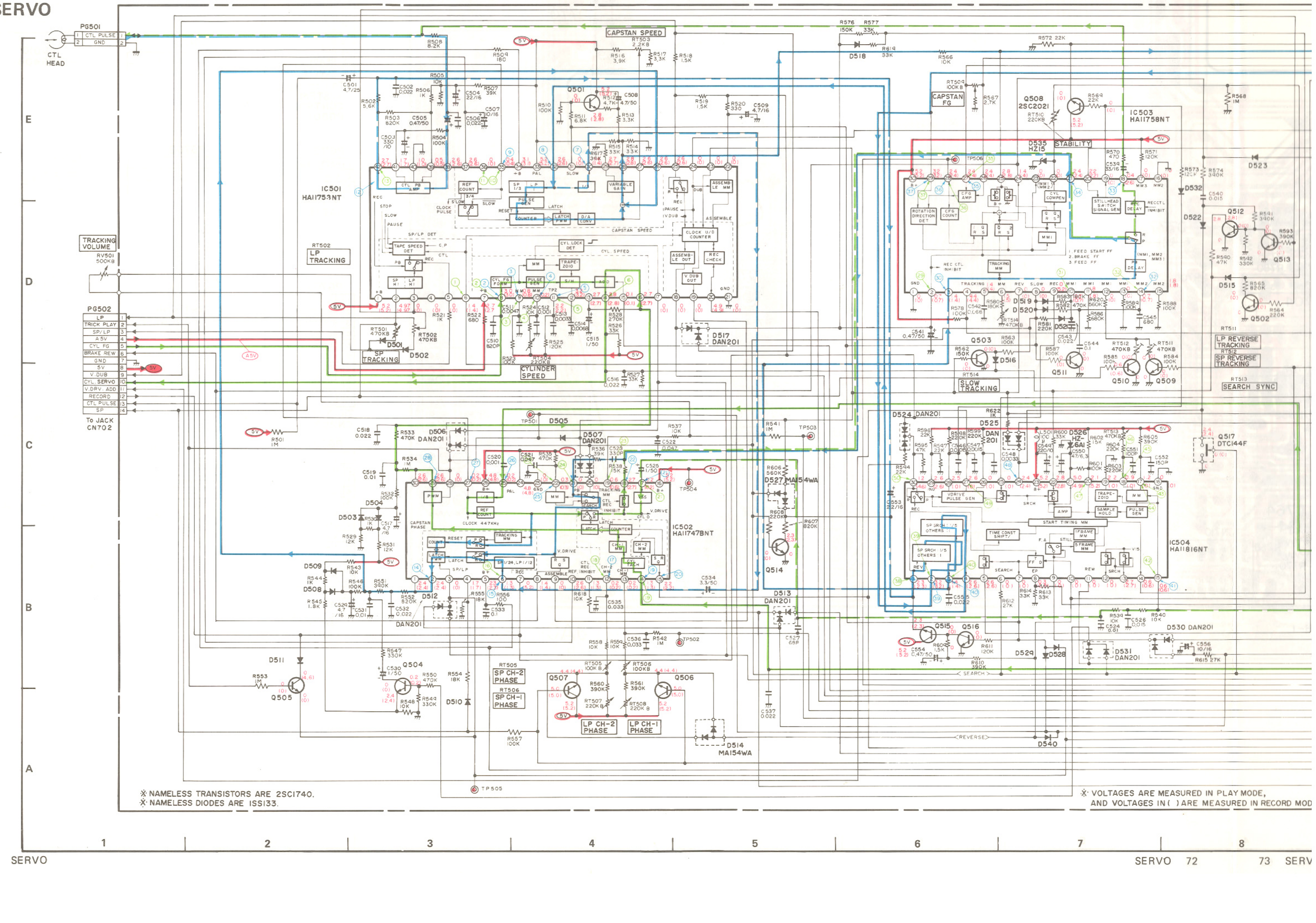
SWITCHING REGULATOR



SWITCHING REGULATOR P. C. B

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

SERVO


PG501
CTL HEAD
CAPSTAN SPEED
IC501 HAI1753NT
IC502 HAI1747BNT
IC503 HAI1758NT
IC504 HAI1816NT
Q501
Q502
Q503
Q504
Q505
Q506
Q507
Q508 2SC2021
Q509
Q510
Q511
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D526 HZ-6A1
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D531 DAN201
D532
D535 HZ15
D540
RT501 470KB
RT502 470KB
RT503 2.2KB
RT504 220KB
RT505 100K B
RT506 100KB
RT507 220K B
RT508 220K B
RT509 100K B
RT510 220KB
RT511 470KB
RT512 470KB
RT513 470KB
RT514 470KB
RV501 500KB
TRACKING VOLUME
LP TRACKING
SP TRACKING
CYLINDER SPEED
LP CH-2 PHASE
LP CH-1 PHASE
SP CH-2 PHASE
SP CH-1 PHASE
SLOW TRACKING
LP REVERSE TRACKING
SP REVERSE TRACKING
SEARCH SYNC
CAPSTAN FG
STABILITY
To JACK CN702
※ NAMELESS TRANSISTORS ARE 2SC1740.
※ NAMELESS DIODES ARE 1SS133.
※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MOD

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Y/CHROMA	81
AUDIO	88
V.S TUNING	92
MPX DEMODULATOR	96
SUB	100
TIMER/INPUT KEY	104
REGULATOR	108
REMORT CONTROL	112

REC/PB CYLINDER SERVO SIGNAL
REC CYLINDER SERVO SIGNAL
PB CYLINDER SERVO
WAVEFORME
REC/PB CAPSTAN SERVO SIGNAL
REC CAPSTAN SERVO SIGNAL
PB CAPSTAN SERVO SIGNAL
WAVEFORME

PG503
1 HEAD SW
2 CAPST SERVO
3 C.FG (-)
4 C.FG (+)
5 C.FG
6 SLOW SPEED
7 FRAME ADV.
8 SLOW
9 CTL INHIBIT
10 SYNC
11 VERT DRIVE
12 SLOW TRACK
13 PAUSE
14 TRICK
To JACK CN703

PG504
1 END LED
2 SW 25Hz
3 REVERSE
4 TACH PULSE
5 LOAD
6 4.43MHz
7 PAUSE
8 SEARCH
9 CYL LOCK
10 CYL ON
11 ASSEMBLE
12 REC CHECK
To JACK CN704

PG505
1 GND
2 CYL. SPEED
3 CAPST. SPEED
4 CYL. FREE RUN
5 CAPST. FG
6 CAPST. FREE RUN
7 5V
8 LP SPEED
9 HEAD SW
TEST POINT

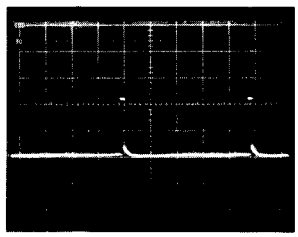
※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN( ) ARE MEASURED IN RECORD MODE.

SERVO P.C.B

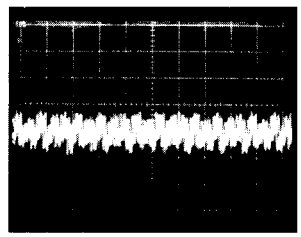
SERVO WAVEFORMS

[IC501]

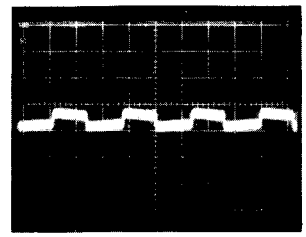
① PIN ⑥ PLAY
2V/10ms. div.



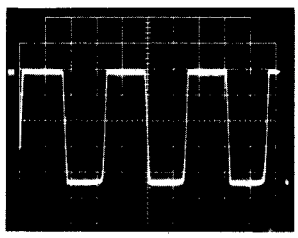
⑥ PIN ⑭ PLAY
50mV/5ms. div.



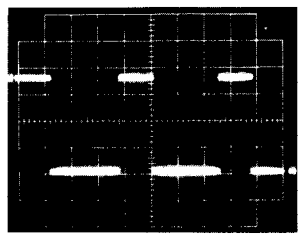
⑪ PIN ㊱ PLAY
50mV/0.5μs. div.



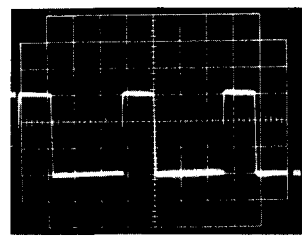
② PIN ⑧ REC/PLAY
1V/0.2ms. div.



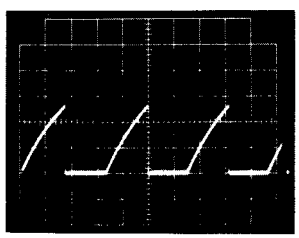
⑦ PIN ㉚ REC
5V/0.5ms. div.



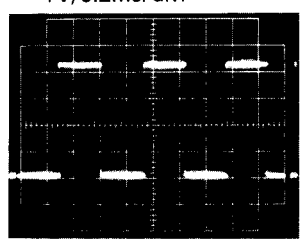
⑫ PIN ㊷ REC
1V/10ms. div.



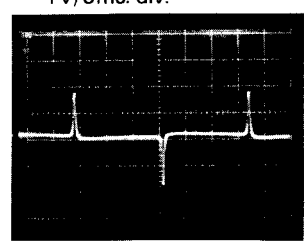
③ PIN ⑨ REC/PLAY
1V/0.2ms. div.



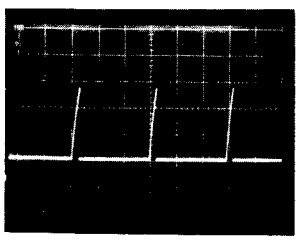
⑧ PIN ㉜ REC
1V/0.2ms. div.



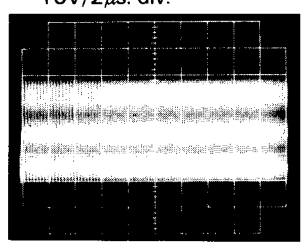
⑬ PIN ㊷ PLAY
1V/5ms. div.



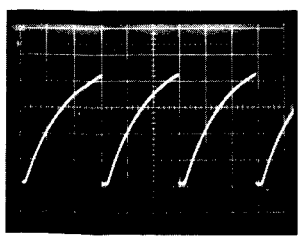
④ PIN ⑩ REC/PLAY
1V/0.2ms. div.



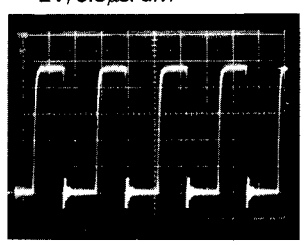
⑨ PIN ㉟ REC
10V/2μs. div.



⑤ PIN ⑪ REC/PLAY
1V/0.2ms. div.

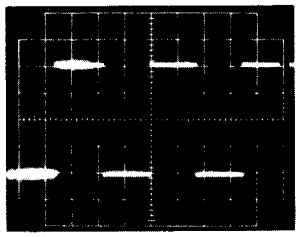


⑩ PIN ㉟ PLAY
2V/0.5μs. div.

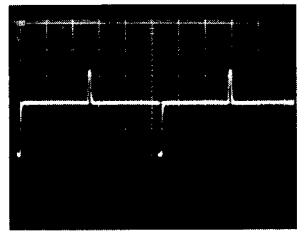


[IC502]

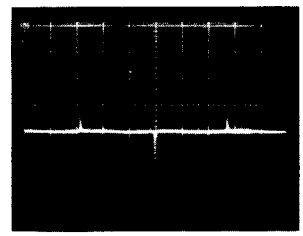
⑭ PIN ② REC
1V/0.5ms. div.



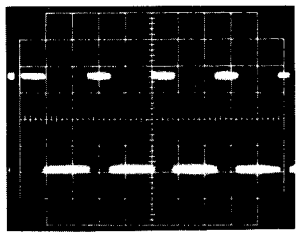
⑲ PIN ⑭ REC/PLAY
1V/5ms. div.



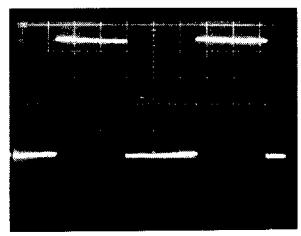
㉔ PIN ㉑ PLAY
1V/5ms. div.



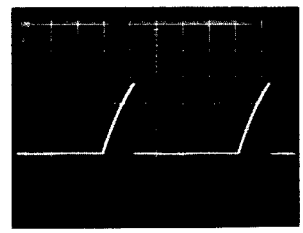
⑮ PIN ⑥ REC
5V/0.5ms. div.



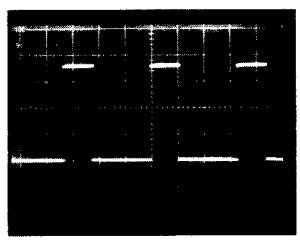
⑳ PIN ⑮ REC
1V/5ms. div.



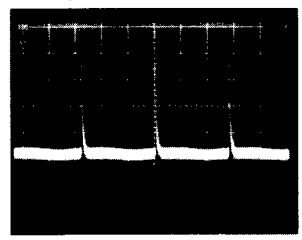
㉕ PIN ㉒ REC/PLAY
1V/5ms. div.



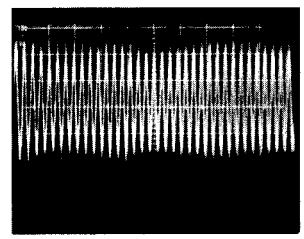
⑯ PIN ⑥ PLAY
5V/0.5ms. div.



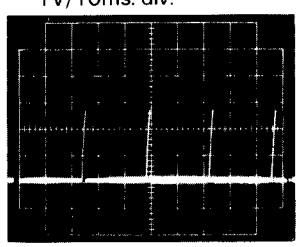
㉑ PIN ⑰ REC/PLAY
2V/5ms. div.



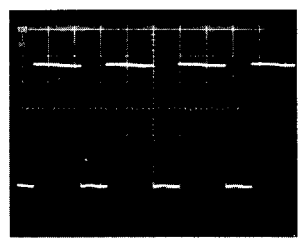
㉖ PIN ㉕ REC
50mV/0.5μs. div.



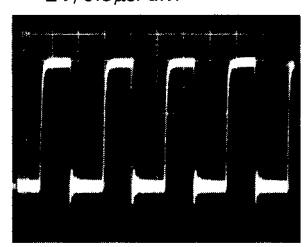
⑰ PIN ⑫ REC
1V/10ms. div.



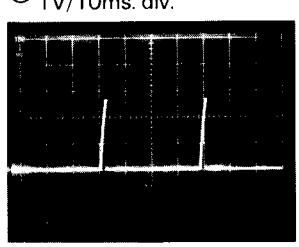
㉒ PIN ⑱ REC
1V/10ms. div.



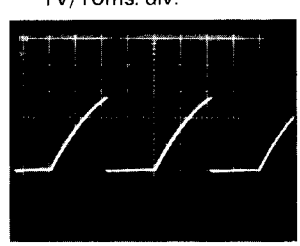
㉗ PIN ㉗ REC
2V/0.5μs. div.



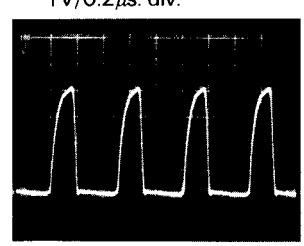
⑱ PIN ⑫ PLAY
1V/10ms. div.



㉓ PIN ⑲ PLAY
1V/10ms. div.

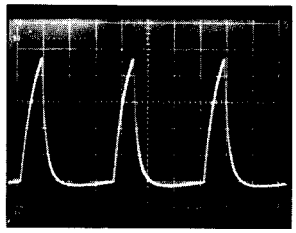


㉘ PIN ㉙ REC
1V/0.2μs. div.

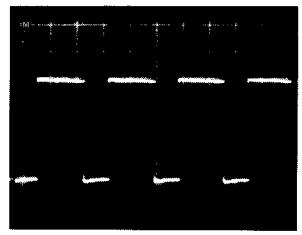


[IC503]

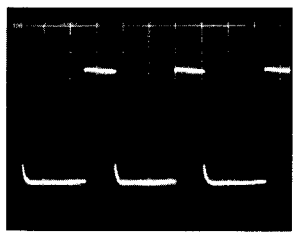
㉙ PIN ② PLAY
5V/50ms. div.



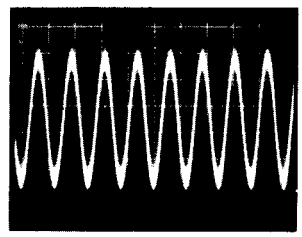
㉞ PIN ㉑ REC
1V/10ms. div.



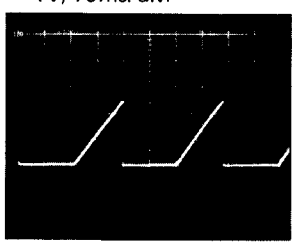
㉚ PIN ③ REC
1V/10ms. div.



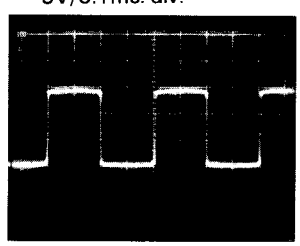
㉟ PIN ㉗ REC/PLAY
10mV/0.5ms. div.



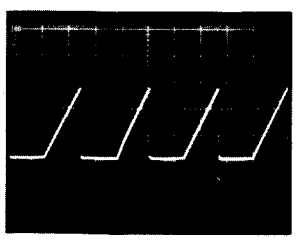
㉛ PIN ⑩ PLAY
1V/10ms. div.



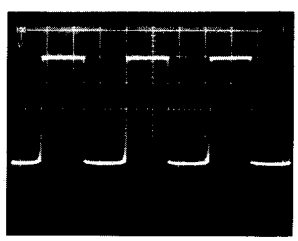
㊱ PIN ㉘ REC/PLAY
5V/0.1ms. div.



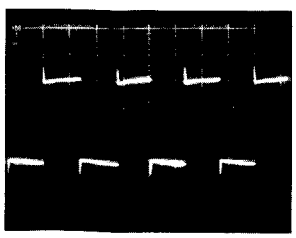
㉜ PIN ⑭ REC/PLAY
1V/10ms. div.



㊲ PIN ㉙ REC/PLAY
1V/0.2ms. div.

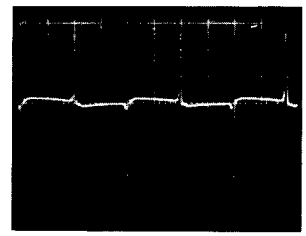


㉝ PIN ⑱ REC
1V/10ms. div.

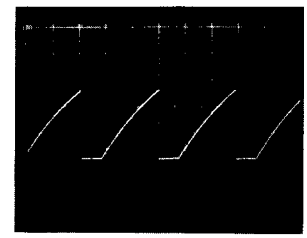


[IC504]

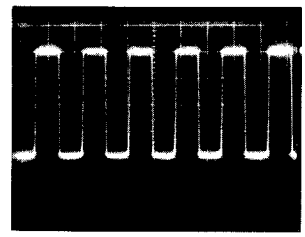
㊳ PIN ① PLAY
5V/10ms. div.



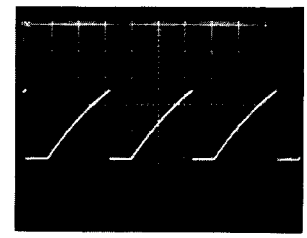
㊸ PIN ⑰ PLAY
1V/10μs. div.



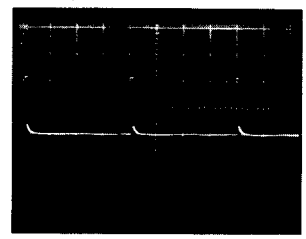
㊴ PIN ② REC/PLAY
1V/0.2ms. div.



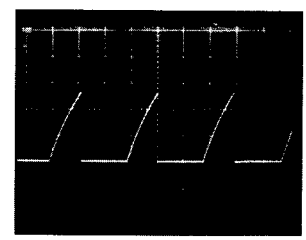
㊹ PIN ⑰ PLAY (SEARCH)
1V/20μs. div.



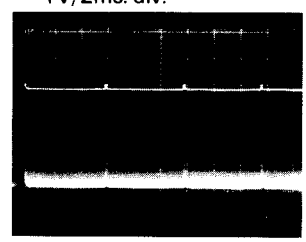
㊵ PIN ③ REC/PLAY
2V/10ms. div.



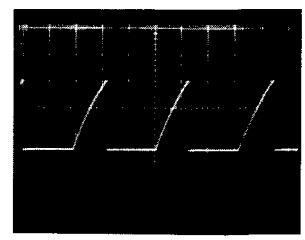
㊺ PIN ⑱ PLAY
1V/10μs. div.



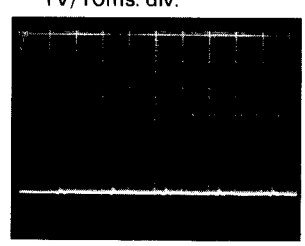
㊶ PIN ⑮ REC
1V/2ms. div.



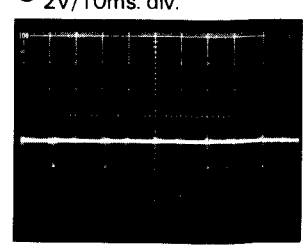
㊻ PIN ⑱ PLAY (SERCH)
1V/20μs. div.



㊷ PIN ⑮ PLAY (STILL)
1V/10ms. div.



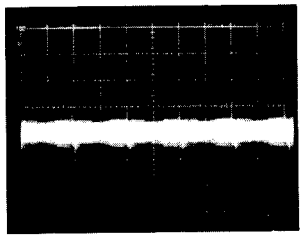
㊼ PIN ⑳ PLAY (SEARCH)
2V/10ms. div.



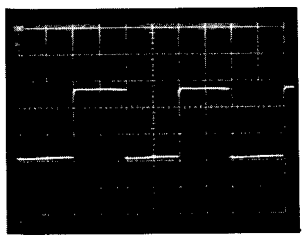
[IC504]

[OTHER]

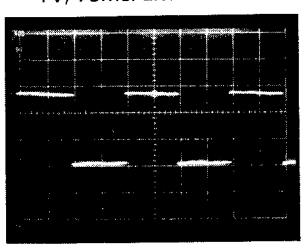
(48) PIN (24) REC
50mV/10μs. div.



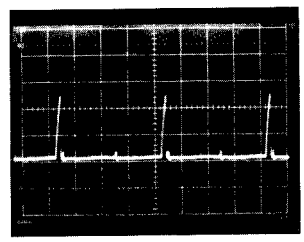
(49) PIN (27) PLAY (STILL)
2V/10ms. div.



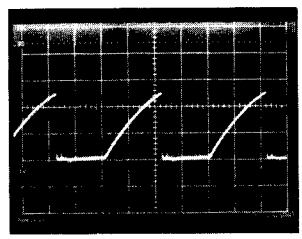
(50) PIN (30) PLAY (SLOW)
1V/10ms. div.



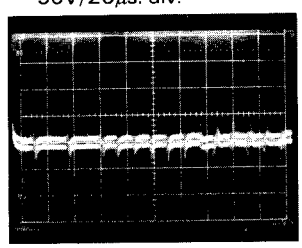
(51) TP505, PG505-① REC
1V/10ms. div.



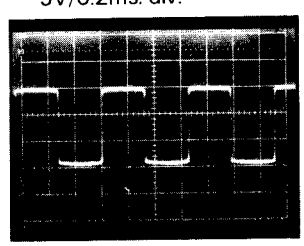
(52) TP503, PG505-② PLAY
1V/10ms. div.



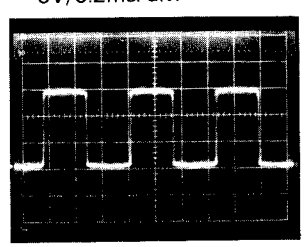
(53) TP501, PG505-③ PLAY
50V/20μs. div.

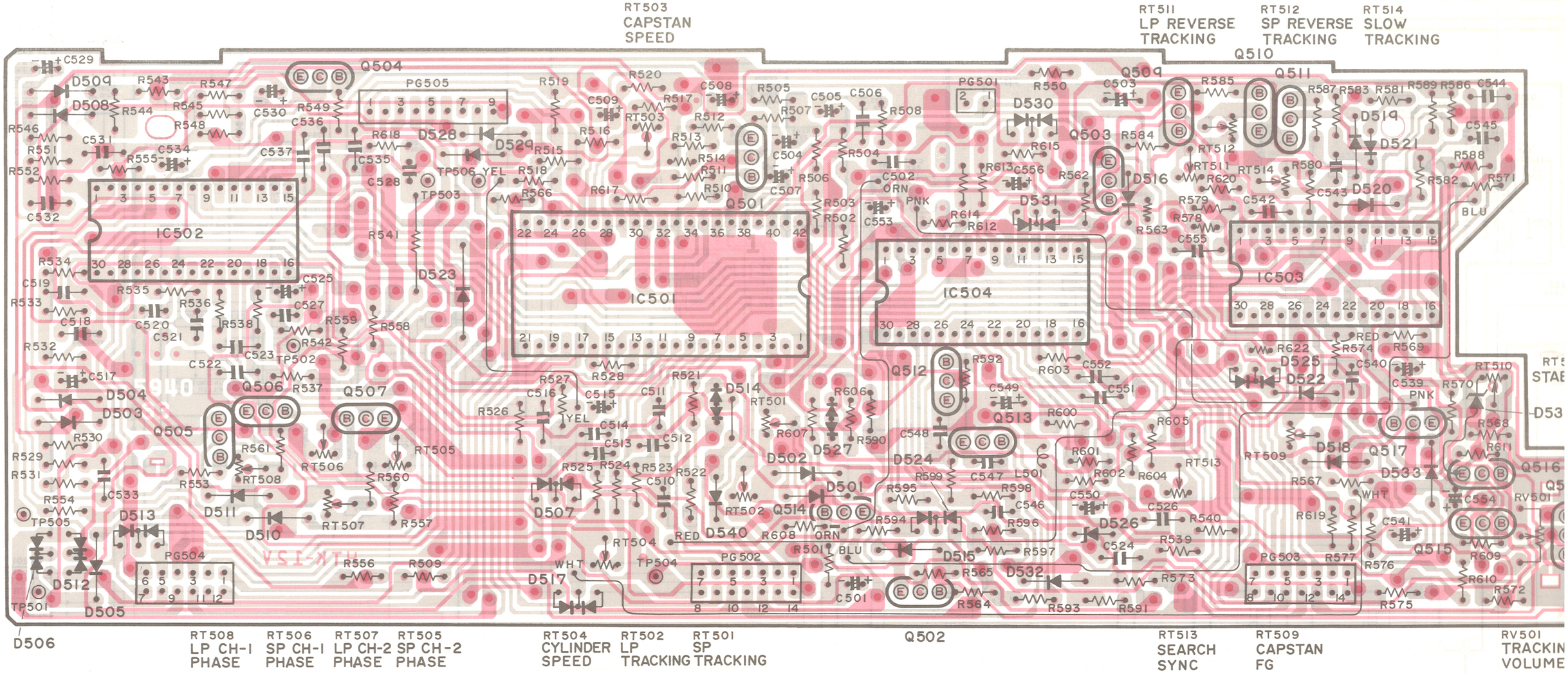


(54) TP504, PG505-⑤ PLAY
5V/0.2ms. div.



(55) TP506, PG505-⑥ PLAY
5V/0.2ms. div.





SERVO P.C.B

IC502

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2.4(2.4)	2.4(2.4)	0 (0)	1.7 (1.7)	2.3(2.3)	1.3 (1.3)	5.0 (5.0)	1.3 (1.3)	0 (0)	2.6(2.6)	1.3 (1.3)	0.2 (0.2)	0.2(0.2)	1.3 (1.3)	0 (0)
30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
2.6(2.6)	2.6(2.6)	0 (0)	0.2 (0.2)	4.8 (4.8)	0.2 (0.2)	0.2(0.2)	0 (0)	0.3 (0.3)	0 (0)	0 (0)	0.6(0.6)	2.7 (2.7)	0.2 (0.2)	5.0 (5.0)

IC503

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0 (0)	0.7(0.7)	1.4 (1.4)	4.4(4.4)	1.4 (1.4)	1.5 (1.5)	0.2 (0.2)	0 (0)	5.2 (5.2)	0.7 (0.7)	1.8 (1.8)	0 (0)	0 (0)	0.7(0.7)	1.8 (1.8)
30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
5.2(5.2)	3.2(3.2)	2.4(2.4)	2.4(2.4)	2.4(2.4)	2.8(2.8)	1.4(1.4)	0 (0)	0 (0)	2.4(2.4)	2.2(2.2)	0 (0)	0.4(2.6)	0 (0)	0 (0)

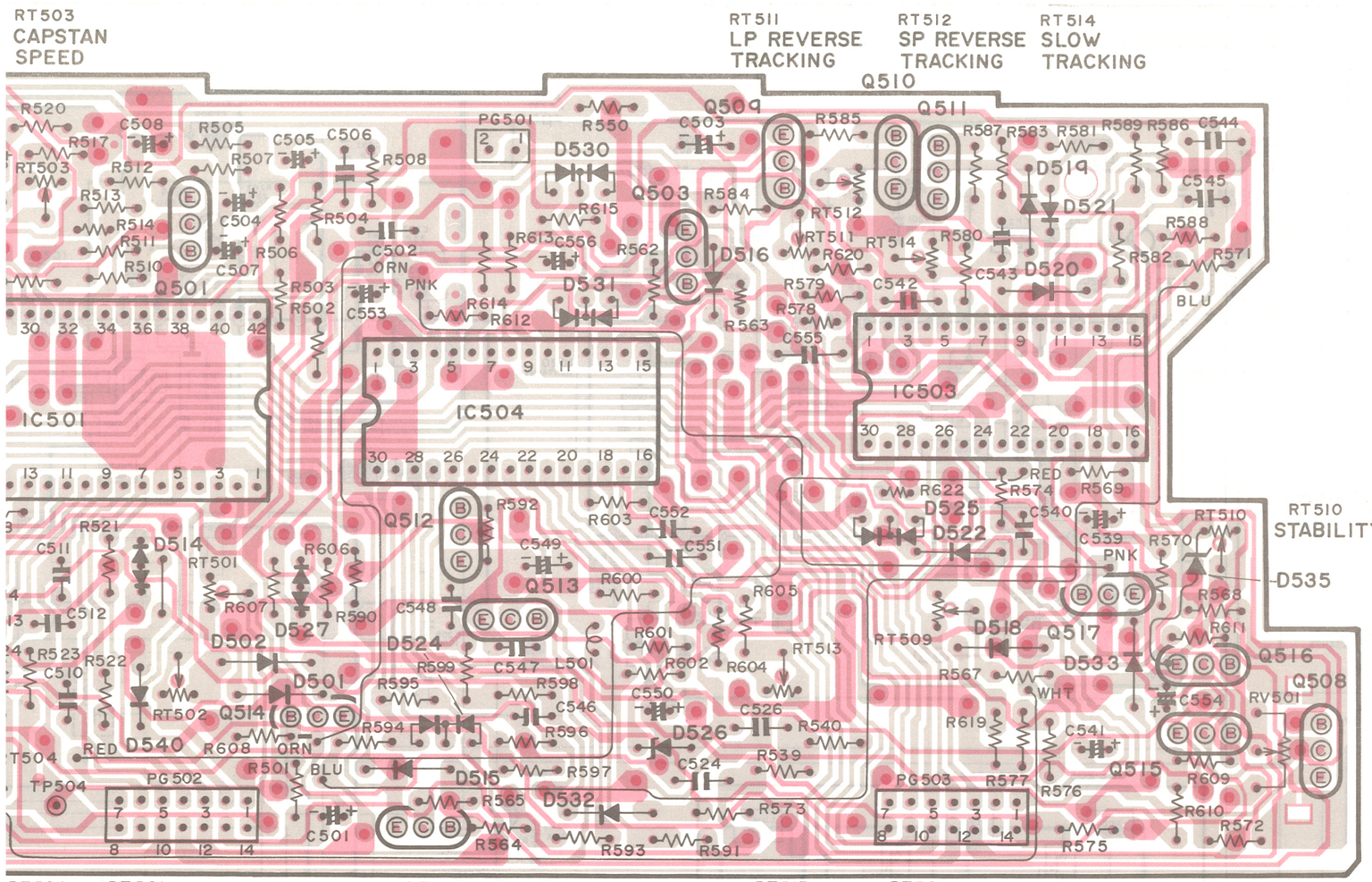
IC504

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2.3(2.3)	3.2(3.2)	0.1 (1.3)	2.6(2.6)	2.6(2.6)	0 (0)	0 (0)	0.3(0.3)	0 (0)	0 (0)	0 (0)	0 (0)	2.7(2.7)	0.6(0.6)	0.6(0.6)
30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
1.2(4.6)	2.6 (2.6)	2.5 (0)	2.6 (0)	0 (0)	0 (0)	2.4 (2.4)	5.2 (5.2)	2.8(2.8)	5.0(4.9)	2.1 (5.2)	2.2 (0)	0.9 (0)	1.2 (0)	0 (0)

IC501

22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
0 (0)	0 (0)	0 (0)	2.6 (2.6)	2.6 (2.6)	2.6(2.6)	2.8(2.8)	2.7 (2.7)	1.4 (1.4)	0 (0)	2.6(2.6)	0 (0)	3.1(3.1)	0.4 (0.4)	0 (0)	2.6 (2.6)	2.6 (2.6)	0.5 (0.5
21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4
0 (0)	4.9 (4.9)	0 (0)	0 (0)	0 (0)	2.7(2.7)	0.1(0.1)	2.8(2.8)	2.7(2.7)	3.2(3.2)	2.2(2.2)	(0.2)	0.8 (0.8)	3.0(3.0)	2.7(2.7)	1.4 (1.4)	0 (0)	0 (0)

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.



PG501	
1	CTL PULSE
2	GND

CTL HEAD

PG502	
1	LP
2	TRICK PLAY
3	SP/LP
4	A5V
5	CYL FG
6	BRAKE REW
7	GND
8	5V
9	V. DUB
10	CYL. SERVO
11	V. DRV. ADD.
12	RECORD
13	CTL PULSE
14	SP

To
JACK
CN702

PG503	
1	HEAD SW
2	CAPST. SERVO
3	C. FG (−)
4	C. FG (+)
5	C. FG
6	SLOW SPEED
7	FRAME ADV.
8	SLOW
9	CTL INHIBIT
10	SYNC
11	VERT DRIVE
12	SLOW TRACK
13	PAUSE
14	TRICK

To
JACK
CN703

PG504	
1	END LED
2	SW25Hz
3	REVERSE
4	TACH PULSE
5	LOAD
6	4.43MHz
7	PAUSE
8	SEARCH
9	CYL. LOCK
10	CYL. ON
11	ASSEMBLE
12	REC CHECK

To
JACK
CN704

PG505	
1	GND
2	CYL. SPEED
3	CAPST. SPEED
4	CYL. FREE RUN
5	CAPST. FG
6	CAPST. FREE RUN
7	5V
8	LP SPEED
9	HEAD SW

TEST POINT

Soldered side

Parts side

Throgh−hole

Soldered side

Parts side

Throgh−hole

SERVO P.C.B

Q501	
B	0 (0)
C	5.2 (5.2)
E	2.8 (2.8)

Q502	
B	0 (0)
C	0 (0)
E	0 (0)

Q503	
B	0 (0)
C	0 (0)
E	0 (0)

Q504	
B	0.2 (0.2)
C	0 (0)
E	2.4 (2.4)

Q505	
B	0 (0)
C	0 (4.6)
E	0 (0)

Q506	
B	5.0 (5.0)
C	5.2 (5.2)
E	4.4 (4.4)

Q507	
B	5.0 (5.0)
C	5.2 (5.2)
E	4.4 (4.4)

Q508	
B	0 (0)
C	5.2 (5.2)
E	0 (0)

Q509	
B	0 (0)
C	0 (0)
E	0 (0)

Q510	
B	0.6 (0.6)
C	0 (0)
E	0 (0)

Q511	
B	0 (0)
C	0 (0)
E	0 (0)

Q512	
B	0 (0)
C	2.8 (2.8)
E	0 (0)

Q513	
B	0 (0)
C	0 (0)
E	0 (0)

Q515	
B	0 (0)
C	5.2 (5.2)
E	2.3 (2.3)

Q516	
B	0 (0)
C	0 (0)
E	0 (0)

Q517	
B	0 (0)
C	2.4 (2.4)
E	0 (0)

IC503

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0 (0)	0.7(0.7)	1.4 (1.4)	4.4(4.4)	1.4 (1.4)	1.5 (1.5)	0.2 (0.2)	0 (0)	5.2 (5.2)	0.7 (0.7)	1.8 (1.8)	0 (0)	0 (0)	0.7(0.7)	1.8 (1.8)
30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
5.2 (5.2)	3.2 (3.2)	2.4 (2.4)	2.4(2.4)	2.4 (2.4)	2.8 (2.8)	1.4 (1.4)	0 (0)	0 (0)	2.4(2.4)	2.2 (2.2)	0 (0)	0.4(2.6)	0 (0)	0 (0)

IC501

22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
0 (0)	0 (0)	0 (0)	2.6 (2.6)	2.6 (2.6)	2.6 (2.6)	2.8 (2.8)	2.7 (2.7)	1.4 (1.4)	0 (0)	2.6 (2.6)	0 (0)	3.1 (3.1)	0.4 (0.4)	0 (0)	2.6 (2.6)	2.6 (2.6)	0.5 (0.5)	1.0 (1.0)	1.7 (1.7)	2.7 (2.7)
21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
0 (0)	4.9 (4.9)	0 (0)	0 (0)	0 (0)	2.7 (2.7)	0.1 (0.1)	2.8 (2.8)	2.7 (2.7)	3.2 (3.2)	2.2 (2.2)	(0.2)	0.8 (0.8)	3.0 (3.0)	2.7 (2.7)	1.4 (1.4)	0 (0)	0 (0)	0 (0)	5.0 (5.0)	5.3 (5.3)

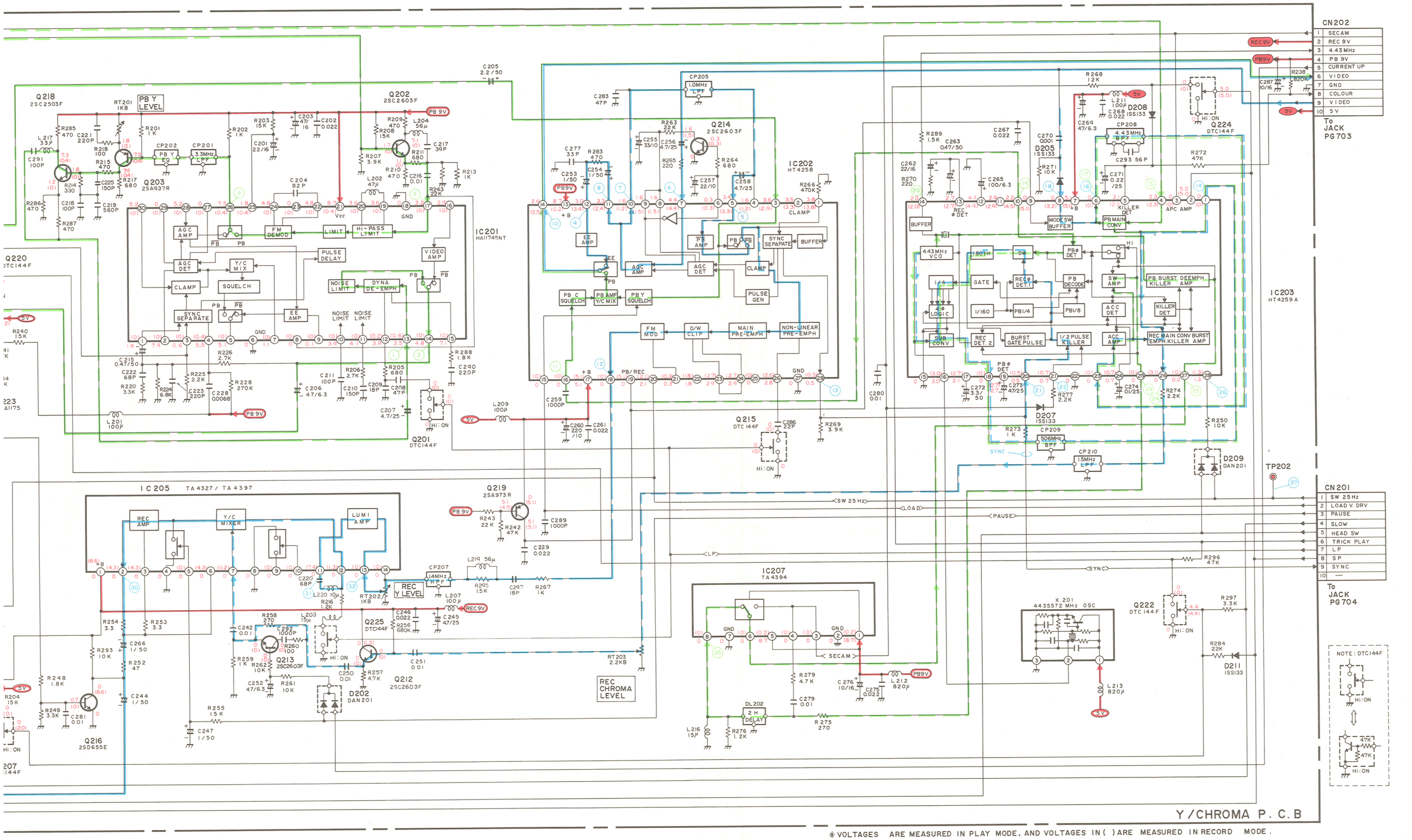
MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

Y/CHROMA

PB VIDEO SIGNAL
PB Y SIGNAL
PB CHROMA SIGNAL
WAVEFORM NUMBER

REC VIDEO SIGNAL
REC Y SIGNAL
REC CHROMA SIGNAL
WAVEFORM NUMBER

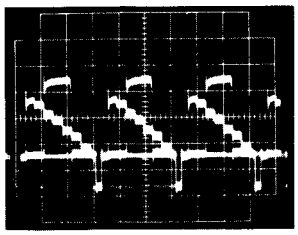
SCHEMATIC DIAGRAM	PAGE
SYSTEM CONTROL	52
JACK	60
RF CONVERTER	63
CYLINDER MOTOR	63
REEL MOTOR	68
CAPSTAN MOTOR	69
SWITCH REGULATOR	70
SERVO	71
Y/CHROMA	81
AUDIO	88
V.S TUNING	92
MPX DEMODULATOR	96
SUB	100
TIMER/INPUT KEY	104
REGULATOR	108
REMORT CONTROL	112


CN202
1 SECAM
2 REC 9V
3 4.43MHz
4 PB 9V
5 CURRENT UP
6 VIDEO
7 GND
8 COLOUR
9 VIDEO
10 5V
To JACK PG703
CN201
1 SW 25Hz
2 LOAD V. DRV
3 PAUSE
4 SLOW
5 HEAD SW
6 TRICK PLAY
7 LP
8 SP
9 SYNC
10 —
To JACK PG704
IC201 HA11745NT
IC202 HT4258
IC203 HT4259A
IC205 TA4327 / TA4397
IC207 TA4394
Q218 2SC2503F
Q202 2SC2603F
Q203 2SA937R
Q214 2SC2603F
Q220 DTC144F
Q201 DTC144F
Q215 DTC144F
Q219 2SA973R
Q225 DTC144F
Q213 2SC2603F
Q212 2SC2603F
Q216 2SD655E
Q224 DTC144F
Q222 DTC144F
X201 4435572 MHz OSC
D202 DAN201
D205 1SS133
D207 1SS133
D208 1SS133
D209 DAN201
D211 1SS133
TP202
PB Y LEVEL
REC Y LEVEL
REC CHROMA LEVEL
NOTE: DTC144F
Y/CHROMA P.C.B
※VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.
4 5 6 7 8 9 10 11 12

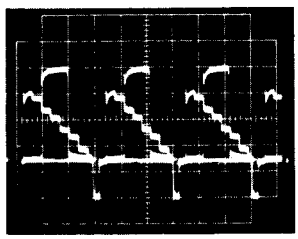
Y/CHROMA WAVEFORMS

[IC201]

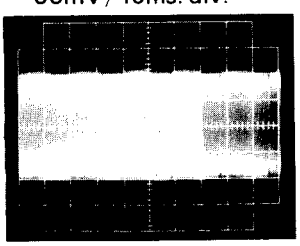
① PIN ⑬ PLAY
0.2V / 20μs. div.



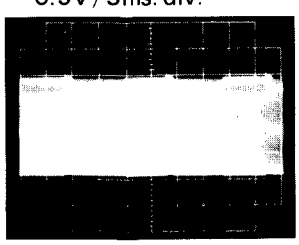
② PIN ⑭ PLAY
0.2V / 20μs. div.



③ PIN ⑰ PLAY
50mV / 10ms. div.

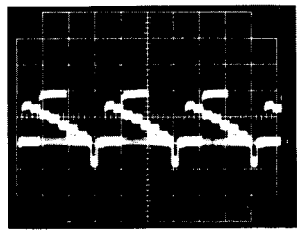


④ PIN ㉖ PLAY
0.5V / 5ms. div.

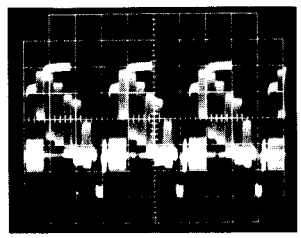


[IC202]

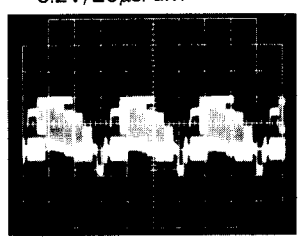
⑤ PIN ⑤ REC
0.2V/20μs. div.



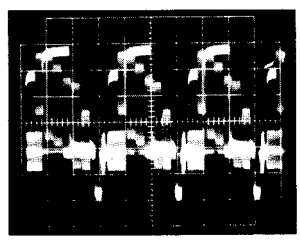
⑥ PIN ⑦ REC
0.2V/20μs. div.



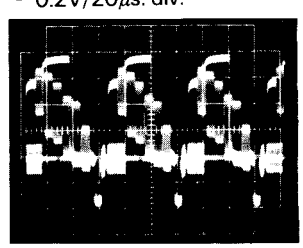
⑦ PIN ⑩ REC
0.2V/20μs. div.



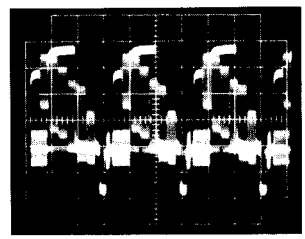
⑧ PIN ⑪ REC
0.2V/20μs. div.



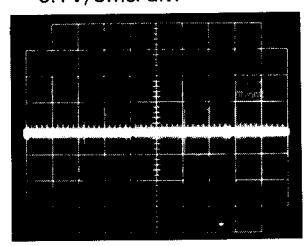
⑨ PIN ⑫ REC
0.2V/20μs. div.



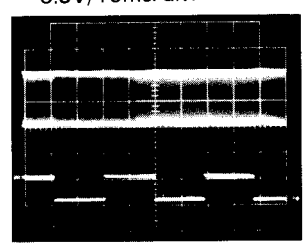
⑩ PIN ⑭ REC
0.2V/20μs. div.



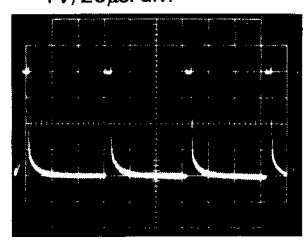
⑪ PIN ⑯ PLAY
0.1V/5ms. div.



⑫ PIN ⑱ REC
0.5V/10ms. div.

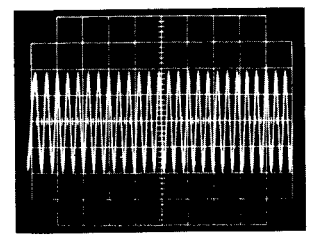


⑬ PIN ㉘ REC
1V/20μs. div.

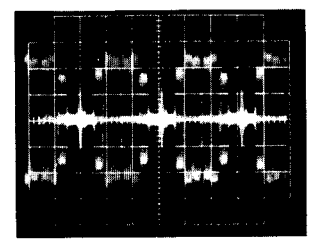


[IC203]

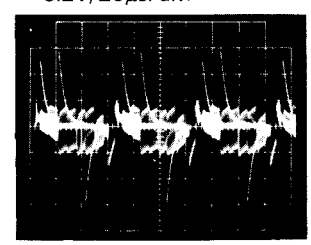
⑭ PIN ① REC
0.1V/0.5μs. div.



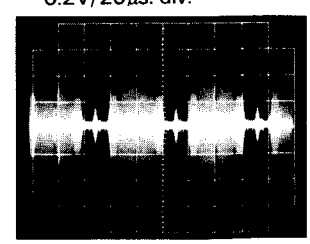
⑮ PIN ④ PLAY
0.5V/20μs. div.



⑯ PIN ⑥ REC
0.2V/20μs. div.



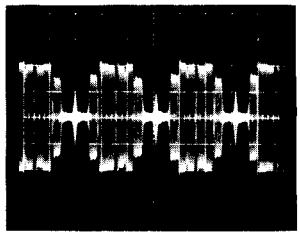
⑰ PIN ⑥ PLAY
0.2V/20μs. div.



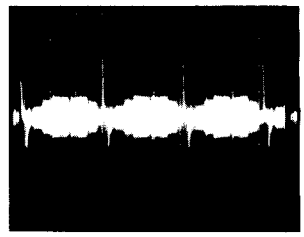
⑱ PIN ⑧ REC
0.2V/20μs. div.

〔IC203〕

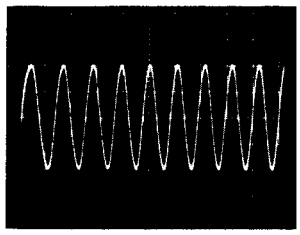
⑲ PIN ⑩ PLAY
0.1V/20μs. div.



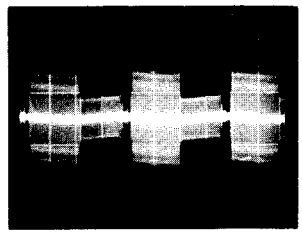
㉔ PIN ㉖ PLAY
10mV/10μs. div.



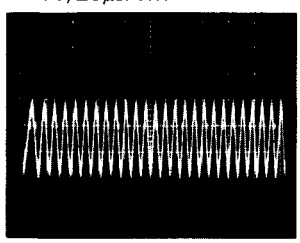
⑳ PIN ⑭ PLAY
0.1V/0.2μs. div.



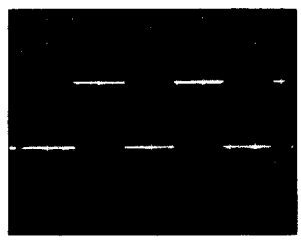
㉕ PIN ㉗ PLAY
50mV/20μs. div.



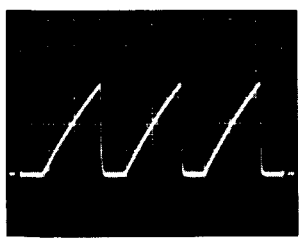
㉑ PIN ⑳ REC
1V/20μs. div.



㉖ PIN ㉘ REC
1V10ms. div.



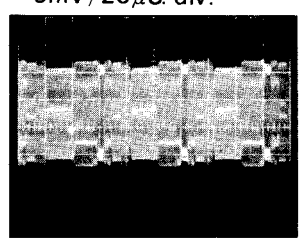
㉒ PIN ㉑ REC
0.5V/20μs. div.



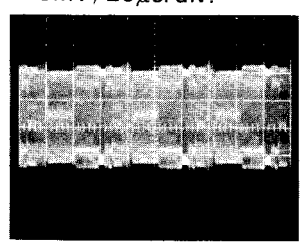
㉓ PIN ㉕ PLAY
0.2V/20μs. div.

[IC204]

㉗ PIN ⑦ REC
5mV/20μS. div.

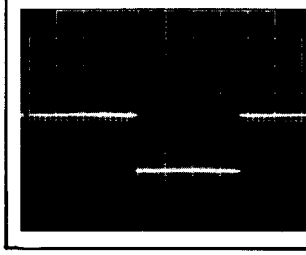


㉘ PIN ⑨ REC
5mV/20μs. div.



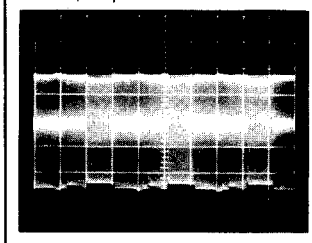
[IC204]

㉙ PIN ⑮ PLAY
0.2V/5ms. div.

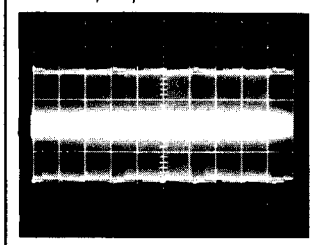


[IC205]

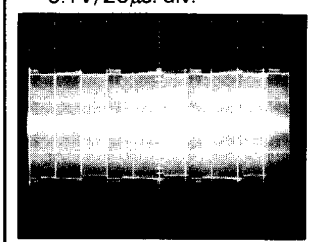
㉚ PIN ② REC
1V/20μs. div.



㉛ PIN ⑪ REC
0.1V/20μs. div.

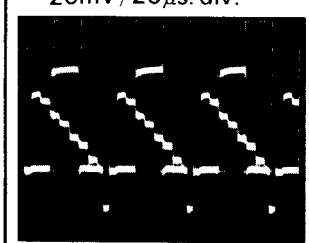


㉜ PIN ⑬ REC
0.1V/20μs. div.



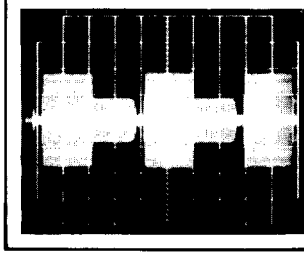
〔IC206〕

㉝ PIN ③ PLAY
20mV/20μs. div.



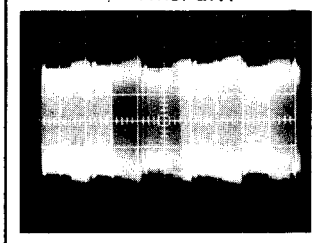
[IC207]

㉟ PIN ⑧ PLAY
50mV/5ms. div.

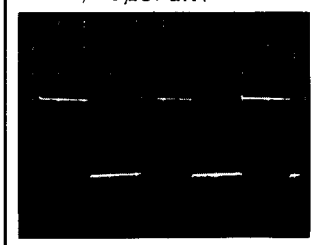


[OTHER]

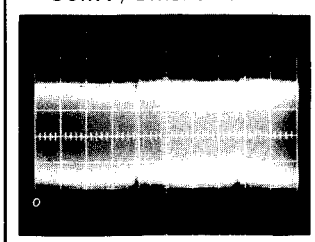
㊱ TP201 PLAY
0.1V/10ms. div.



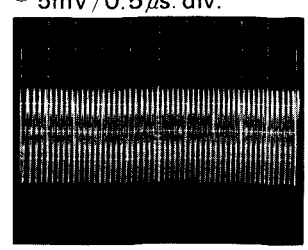
㊲ TP202 REC
1V/10μs. div.

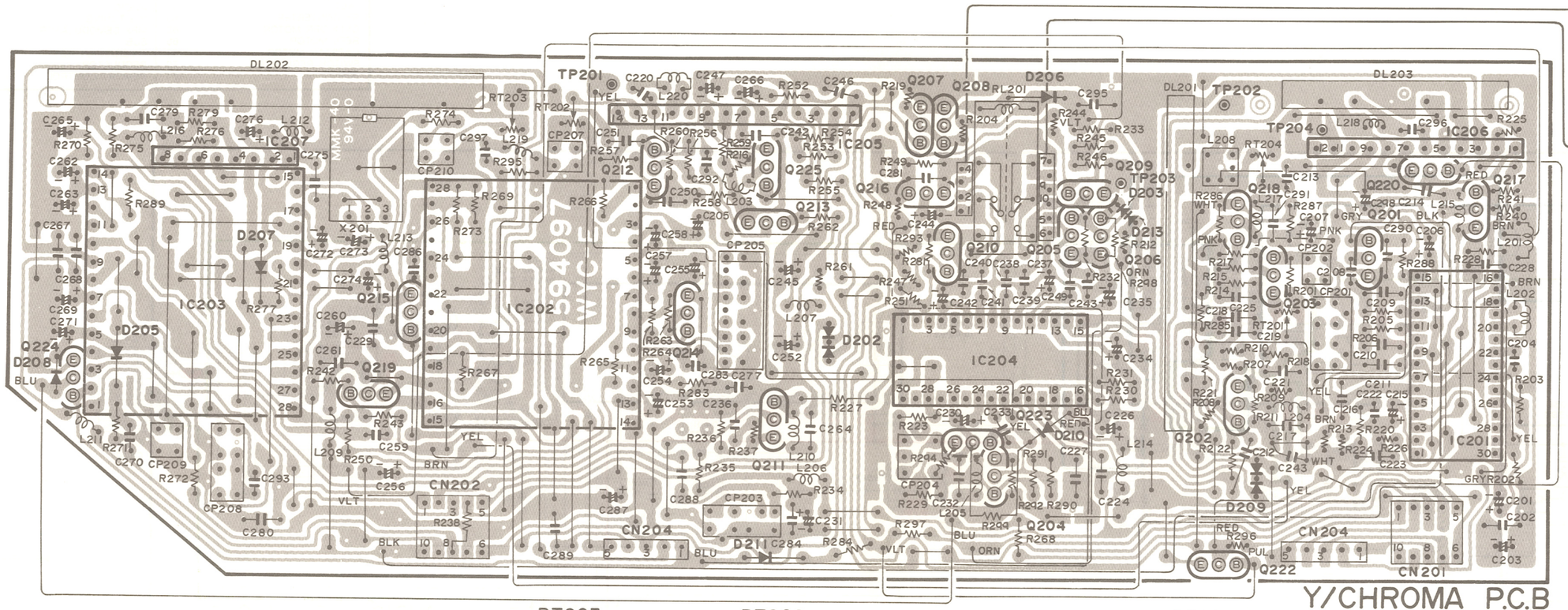


㊳ TP203 REC
50mV/5ms. div.



㉞ PIN ⑥ PLAY
5mV/0.5μs. div.





CN203

1	CH-2 REC
2	CH-2 LP
3	CH-2 SP
4	GND
5	STILL PB
6	GND
7	GND
8	CH-1 SP
9	CH-1 REC
10	CH-1 LP

To VIDEO HEAD

CN201

1	SW25Hz
2	LOAD V. DRV
3	PAUSE
4	SLOW
5	HEAD SW
6	TRICK PLAY
7	LP
8	SP
9	SYNC
10	———

To JACK PG704

Y/CHROMA P.C.B

RT203 REC CHROMA LEVEL

RT202 REC Y LEVEL

RT204 SKEW

RT201 PB Y LEVEL

IC201

15	7.1 (0)	16	2.9 (0)
14	4.8 (0)	17	3.2 (0)
13	3.5 (0.6)	18	0 (0)
12	3.9 (0.2)	19	3.6 (0)
11	4.1 (0)	20	3.6 (0)
10	3.9 (0)	21	8.7 (0.4)
9	0.1 (0)	22	4.8 (0)
8	0 (0)	23	0 (0)
7	1.1 (0)	24	4.8 (0)
6	0 (0)	25	1.8 (0.4)
5	5.1 (0)	26	7.5 (0.4)
4	5.5 (0.4)	27	0 (0)
3	0.6 (0)	28	5.2 (0)
2	7.9 (0)	29	0 (0)
1	1.9 (0)	30	5.2 (0)

IC202

28	0.5 (0.5)	1	3.8 (3.8)
27	0 (0)	2	3.5 (3.3)
26	2.8 (2.6)	3	3.6 (2.9)
25	0 (0)	4	1.6 (1.2)
24	2.9 (2.7)	5	3.4 (3.3)
23	2.9 (2.7)	6	0.3 (0.3)
22	1.8 (1.8)	7	4.4 (4.4)
21	0.3 (0.3)	8	1.6 (1.5)
20	2.1 (2.1)	9	1.6 (1.5)
19	0 (5.1)	10	1.6 (1.2)
18	0 (0)	11	3.3 (2.4)
17	5.1 (5.1)	12	3.0 (3.4)
16	0 (0)	13	8.7 (0.2)
15	0 (0)	14	2.6 (2.5)

IC203

14	2.0 (2.0)	15	0 (0)
13	2.7 (2.7)	16	3.0 (3.0)
12	4.9 (4.9)	17	2.1 (2.7)
11	2.9 (2.9)	18	0 (0)
10	2.2 (4.5)	19	2.7 (2.7)
9	0 (5.1)	20	0.5 (0.5)
8	0 (3.2)	21	0.7 (0.7)
7	5.1 (5.1)	22	0 (0)
6	0 (0)	23	0 (0)
5	2.1 (2.1)	24	0.7 (0.7)
4	2.3 (2.3)	25	0 (0)
3	0 (0)	26	0 (3.1)
2	5.0 (5.0)	27	0.2 (0)
1	0 (0)	28	1.3 (1.3)

IC204

1	0 (0)	30	0 (0)
2	0 (0)	29	0 (0)
3	1.6 (0)	28	1.6 (0)
4	0 (0)	27	0 (0)
5	0 (0)	26	0 (0)
6	1.6 (0)	25	0 (0)
7	0.6 (0)	24	0.8 (0)
8	0 (0)	23	3.6 (0)
9	0.6 (0)	22	2.9 (0)
10	1.6 (0)	21	5.0 (0)
11	0.6 (0)	20	2.0 (0)
12	1.6 (0)	19	3.2 (0)
13	4.7 (0)	18	5.0 (0)
14	0 (0)	17	5.0 (5.0)
15	2.2 (2.2)	16	0 (0)

IC205

7	6	5	4	3	2	1
0 (0.2)	0 (4.3)	0 (0)	0 (0)	0 (4.3)	0 (4.3)	0 (8.6)
8	9	10	11	12	13	14
0 (0)	0 (0)	0 (0)	0 (7.4)	0 (1.3)	0 (0)	0 (0)

IC207

4	3	2	1
0 (0)	0 (0)	0 (0)	8.7 (0.2)
5	6	7	8
8.7 (0.2)	0 (0)	0 (0)	0 (0)

IC206

12	11	10	9	8	7	6	5	4	3	2	1
2.6 (0)	2.5 (0)	5.0 (0)	0 (0)	0 (0)	1.5 (0)	2.4 (0)	2.4 (0)	0 (0)	1.6 (0)	0.6 (0)	4.9 (0)

Q201

B	0 (0)
C	0 (0)
E	0 (0)

Q202

B	1.7 (0)
C	7.1 (0.2)
E	1.1 (0)

Q203

B	7.3 (0.4)
C	1.8 (0)
E	7.9 (0.4)

Q204

B	2.3 (0)
C	8.5 (0.2)
E	1.7 (0)

Q205

B	8.1 (0.7)
C	8.5 (0)
E	7.5 (0)

Q206

B	5.9 (0.4)
C	0 (0.7)
E	0 (0)

Q207

B	0 (2.0)
C	0 (0)
E	0 (0)

Q208

B	0 (0)
C	5.3 (5.3)
E	0 (0)

Q209

B	0 (0.8)
C	0 (0)
E	0 (0)

Q210

B	0 (0.8)
C	0 (0)
E	0 (0)

Q211

B	5.1 (0)
C	7.0 (0)
E	4.5 (0)

Q212

B	0 (5.7)
C	0 (8.7)
E	0 (5.3)

Q213

B	0.4 (0.4)
C	0 (0)
E	0 (0)

Q214

B	0.3 (0.3)
C	1.6 (1.5)
E	0 (0)

Q215

B	0 (0)
C	0 (0)
E	0 (0)

Q216

B	0.7 (0)
C	0 (8.6)
E	0 (0)

Q217

B	0 (0.4)
C	0 (5.2)
E	0 (0)

Q218

B	1.8 (0)
C	7.3 (0.4)
E	1.2 (0)

Q219

B	5.1 (4.5)
C	0 (5.1)
E	5.1 (5.1)

Q220

B	0 (0)
C	4.9 (0)
E	0 (0)

Q222

B	4.4 (4.4)
C	0 (0)
E	0 (0)

Q223

B	2.3 (0)
C	5.0 (5.0)
E	0 (0)

Q224

B	5.0 (5.0)
C	0 (0)
E	0 (0)

Q225

B	0 (0)
C	0 (1.3)
E	0 (0)

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE

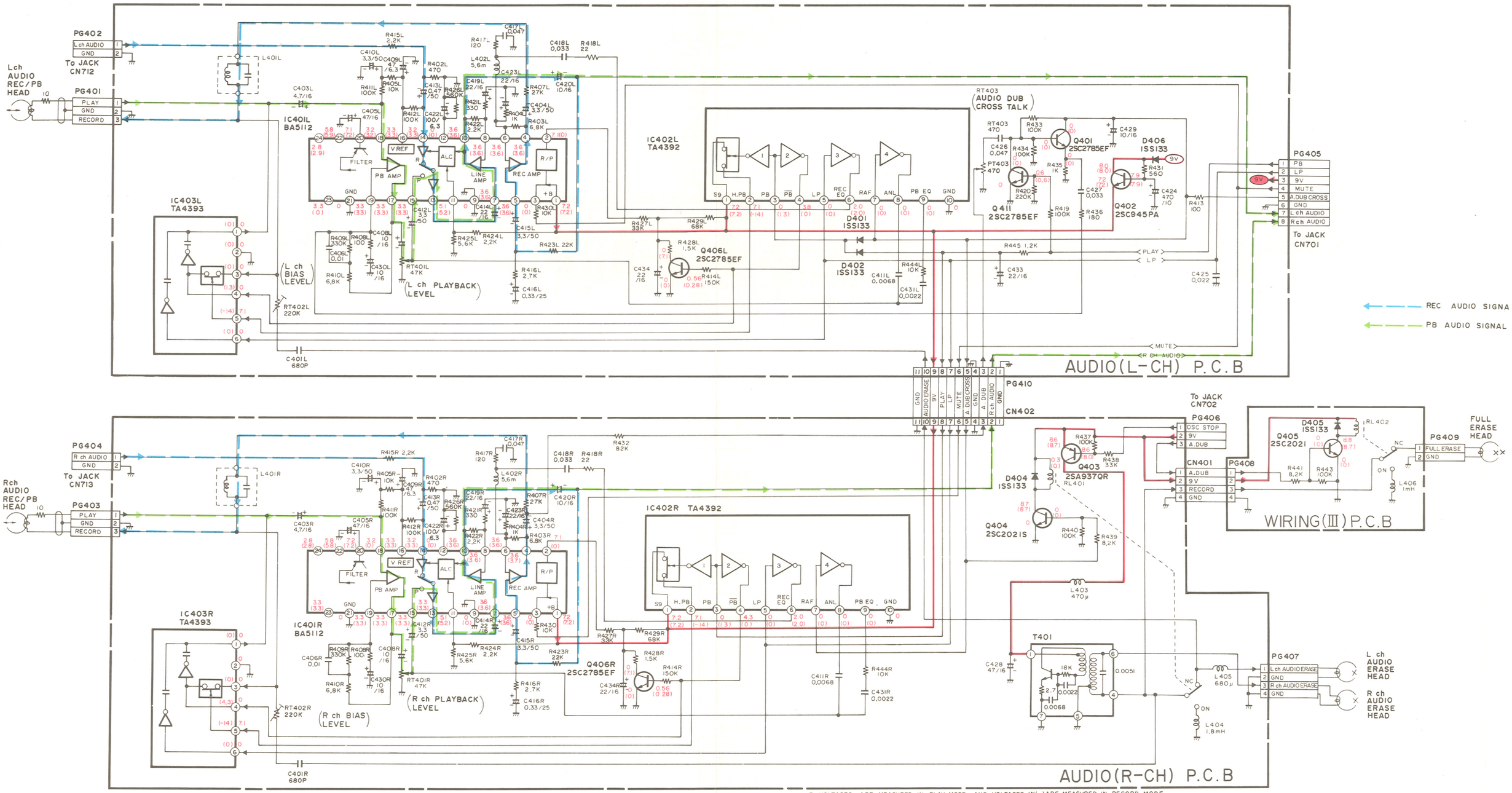
CN202

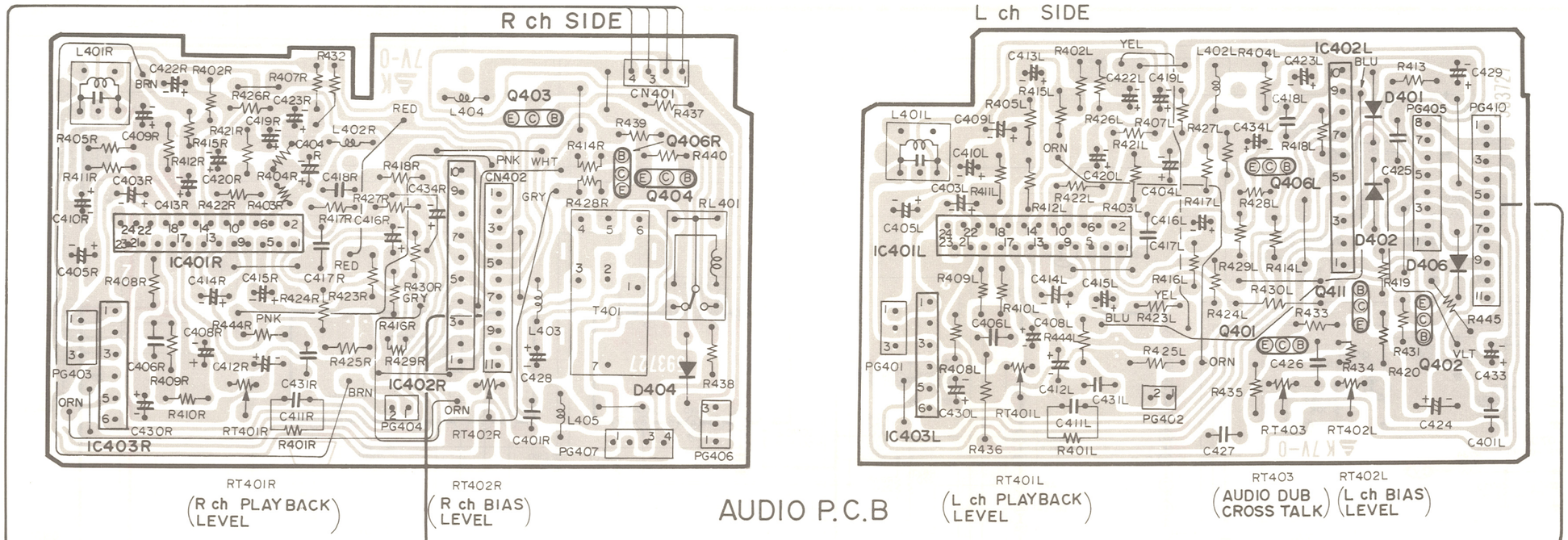
1	SECAM
2	REC 9V
3	4.43MHz
4	PB 9V
5	CURRENT UP
6	VIDEO
7	GND
8	COLOUR
9	VIDEO
10	5V

To JACK PG703

AUDIO

SCHEMATIC DIAGRAM	PAGE	SCHEMATIC DIAGRAM	PAGE
SYSTEM CONTROL	52	Y/CHROMA	81
JACK	60	AUDIO	88
RF CONVERTER	63	V.S TUNING	92
CYLINDER MOTOR	63	MPX DEMODULATOR	96
REEL MOTOR	68	SUB	100
CAPSTAN MOTOR	69	TIMER/INPUT KEY	104
SWITCH REGULATOR	70	REGULATOR	108
SERVO	71	REMORT CONTROL	112





PG405

1	PB
2	LP
3	9V
4	MUTE
5	A.DUB CROSS
6	GND
7	Lch AUDIO
8	Rch AUDIO

To JACK CN701

PG406

1	OSC STOP
2	9V
3	A.DUB

To JACK CN702

PG402

1	Lch AUDIO
2	GND

To JACK CN712

PG404

1	Rch AUDIO
2	GND

To JACK CN713

CN401

BRN	1	A.DUB
RED	2	9V
ORN	3	RECORD
YEL	4	GND

To WIRING III PG408

PG407

1	L ch AUDIO ERASE
2	GND
3	R ch AUDIO ERASE
4	GND

To L ch /R ch AUDIO ERASE HEAD

PG401

1	PLAY
2	GND
3	RECORD

10Ω — L ch AUDIO REC/PB HEAD

PG403

1	PLAY
2	GND
3	RECORD

10Ω — Rch AUDIO REC/PB HEAD

PG402 ⟷ PG410

1	GND	1
2	R ch AUDIO	2
3	A. DUB	3
4	GND	4
5	A. DUB CROSS	5
6	MUTE	6
7	LP	7
8	PLAY	8
9	9V	9
10	AUDIO ERASE	10
11	GND	11

Q404

B	0 (0)
C	8.7 (8.7)
E	0 (0)

Q411

B	0.6 (0.6)
C	0 (0)
E	0 (0)

Q401L/R

B	0 (0)
C	0 (0)
E	0 (0)

Q402L/R

B	7.9 (7.9)
C	8.0 (8.0)
E	7.2 (7.2)

Q406L/R

B	0.56 (0.28)
C	0 (7.1)
E	0 (0)

IC401L/R

1	2	3	4	5	6	7	8	9	10	11	12
7.2 (7.2)	7.1 (0)	0 (0)	3.6 (3.6)	3.6 (3.6)	3.6 (3.6)	3.6 (3.6)	3.6 (3.6)	0 (0)	3.6 (3.6)	5.1 (5.2)	0 (0)
13	14	15	16	17	18	19	20	21	22	23	24
3.3 (3.3)	3.2 (3.3)	3.3 (3.3)	3.3 (3.3)	3.3 (3.3)	3.2 (3.2)	3.3 (3.3)	7.1 (7.2)	0 (0)	5.8 (5.9)	3.3 (0)	2.8 (2.9)

IC402L/R

1	2	3	4	5	6	7	8	9	10
7.2 (7.2)	7.1 (-14)	0 (1.3)	3.8 (0)	0 (0)	2.0 (2.0)	0 (0)	0 (0)	0 (0)	0 (0)

IC403L/R

1	2	3	4	5	6
0 (0)	0 (0)	0 (0)	0 (1.3)	7.1 (-14)	0 (0)

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED RECORD MODE

V·S TUNING

SCHEMATIC DIAGRAM	PAGE	SCHEMATIC DIAGRAM	PAGE
SYSTEM CONTROL	52	Y/CHROMA	81
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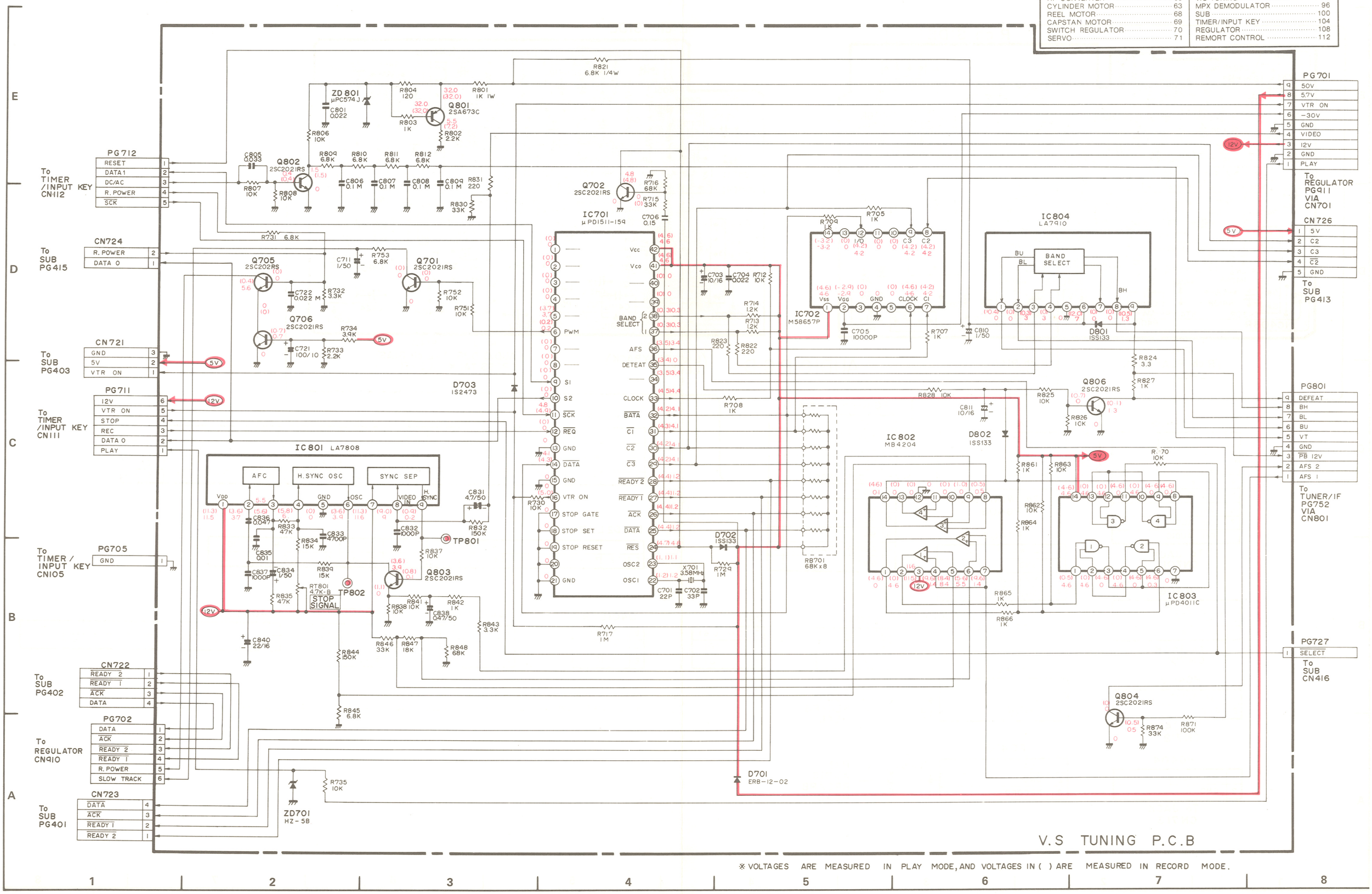
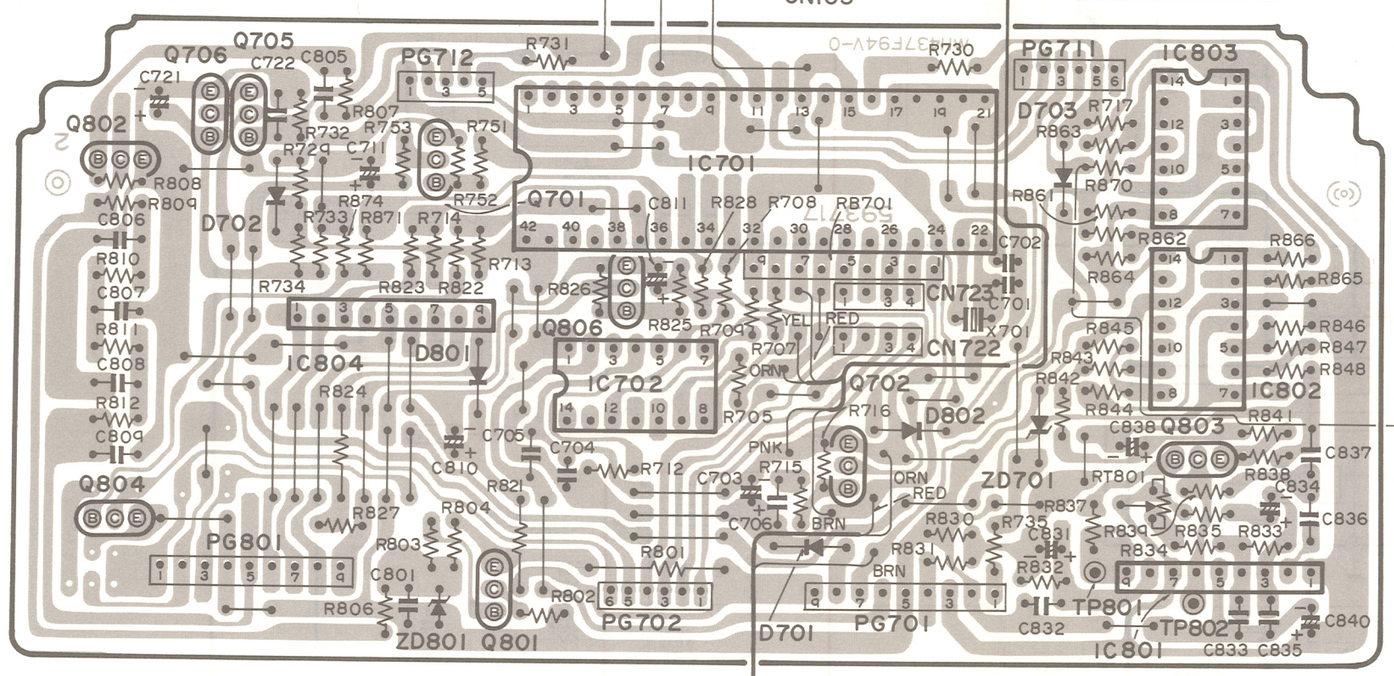
CAPSTAN MOTOR	69	TIMER/INPUT KEY	104
SWITCH REGULATOR	70	REGULATOR	108
SERVO	71	REMORT CONTROL	112



※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.



V.S TUNING P.C.B

PG701

9	50V
8	5.7V
7	VTR ON
6	-30V
5	GND
4	VIDEO
3	12V
2	GND
1	PLAY

To REGULATOR PG911 VIA CN701

PG711

6	12V
5	VTR ON
4	STOP
3	REC
2	DATA O
1	PLAY

To TIMER/ INPUT KEY CN111

PG712

1	RESET
2	DATA I
3	DC/AC
4	R. POWER
5	$\overline{SCK}$

To TIMER / INPUT KEY CN112

PG702

1	DATA
2	$\overline{ACK}$
3	$\overline{READY\,2}$
4	$\overline{READY\,1}$
5	R. POWER
6	SLOW TRACK

To REGULATOR CN910

PG727

1	$\overline{SELECT}$

To SUB CN416

CN722

1	$\overline{READY\,2}$
2	$\overline{READY\,1}$
3	$\overline{ACK}$
4	DATA

To SUB PG402

CN721

ORN	3	GND
RED	2	5V
BRN	1	VTR ON

To SUB PG403

PG801

9	DEFEAT
8	BH
7	BL
6	BU
5	VT
4	GND
3	$\overline{PB}$ 12V
2	AFS 2
1	AFS 1

To TUNER/IF PG752 VIA CN801

CN723

4	DATA
3	$\overline{ACK}$
2	$\overline{READY\,1}$
1	$\overline{READY\,2}$

To SUB PG401

IC701

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
0 (0)	0 (0)	0 (0)	0 (0)	3.7(3.7)	0.2(0.2)	0 (0)	0 (0)	0 (0)	0 (0)	4.8(4.9)	0 (0)	0 (0)	4.1(4.3)	0 (0)	0(5.0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22
4.6(4.6)	4.6(4.6)	0 (0)	0 (0)	0.3(0.3)	0.3(0.3)	3.4(3.5)	0 (3.4)	3.4(3.5)	4.4(4.5)	4.1(4.3)	4.1(4.2)	4.1(4.2)	4.1(4.2)	1.2(4.4)	1.2(4.4)	1.2(4.4)	1.2(4.4)	4.8(4.7)	1.1(1.1)	1.2(1.2)

IC702

1	2	3	4	5	6	7
4.6(4.6)	-2.9(-2.9)	0 (0)	0 (0)	0 (0)	4.6(4.6)	4.2(4.2)
14	13	12	11	10	9	8
-3.2(-3.2)	0 (0)	4.2(4.2)	0 (0)	0 (0)	4.2(4.2)	4.2(4.2)

IC801

9	8	7	6	5	4	3	2	1
0.2(0.9)	9.0(9.0)	11.6(11.3)	3.9(3.6)	0 (0)	6.0(5.8)	5.5(5.6)	3.7(3.6)	11.5(11.3)

IC804

1	2	3	4	5	6	7	8	9
0(10.4)	0 (0)	3.0(0.3)	3.0 (0)	0 (0)	7.0(12.0)	0 (0)	0 (0)	1.3(10.5)

IC802

14	0.1(4.6)	1	0 (4.6)
13	0 (0)	2	4.6(0)
12	0 (0)	3	11.6(11.5)
11	0 (0)	4	1.4(9.6)
10	0 (0)	5	8.4(8.4)
9	0 (1.0)	6	5.5(5.6)
8	0.5(0.5)	7	1.4(9.6)

IC803

14	4.6(4.6)	1	4.6(0.5)
13	4.6 (0)	2	4.6 (0)
12	4.6 (0)	3	0 (4.6)
11	0 (4.6)	4	4.6 (0)
10	4.6 (0)	5	0 (4.6)
9	0 (4.6)	6	0.3(4.6)
8	0.1(4.6)	7	0 (0)

Q701

B	0 (0)
C	0 (0)
E	0 (0)

Q702

B	0 (0)
C	4.8(4.8)
E	0 (0)

Q705

B	0 (0)
C	5.6(0.4)
E	0 (0)

Q706

B	0.7(0.7)
C	0 (0)
E	0 (0)

Q801

B	32.0(32.0
C	5.5(7.2)
E	32.0(32.0

Q802

B	0.4(0.4)
C	1.5(1.5)
E	0 (0)

Q803

B	0.1(0.8)
C	3.9(3.6)
E	0 (1.1)

Q804

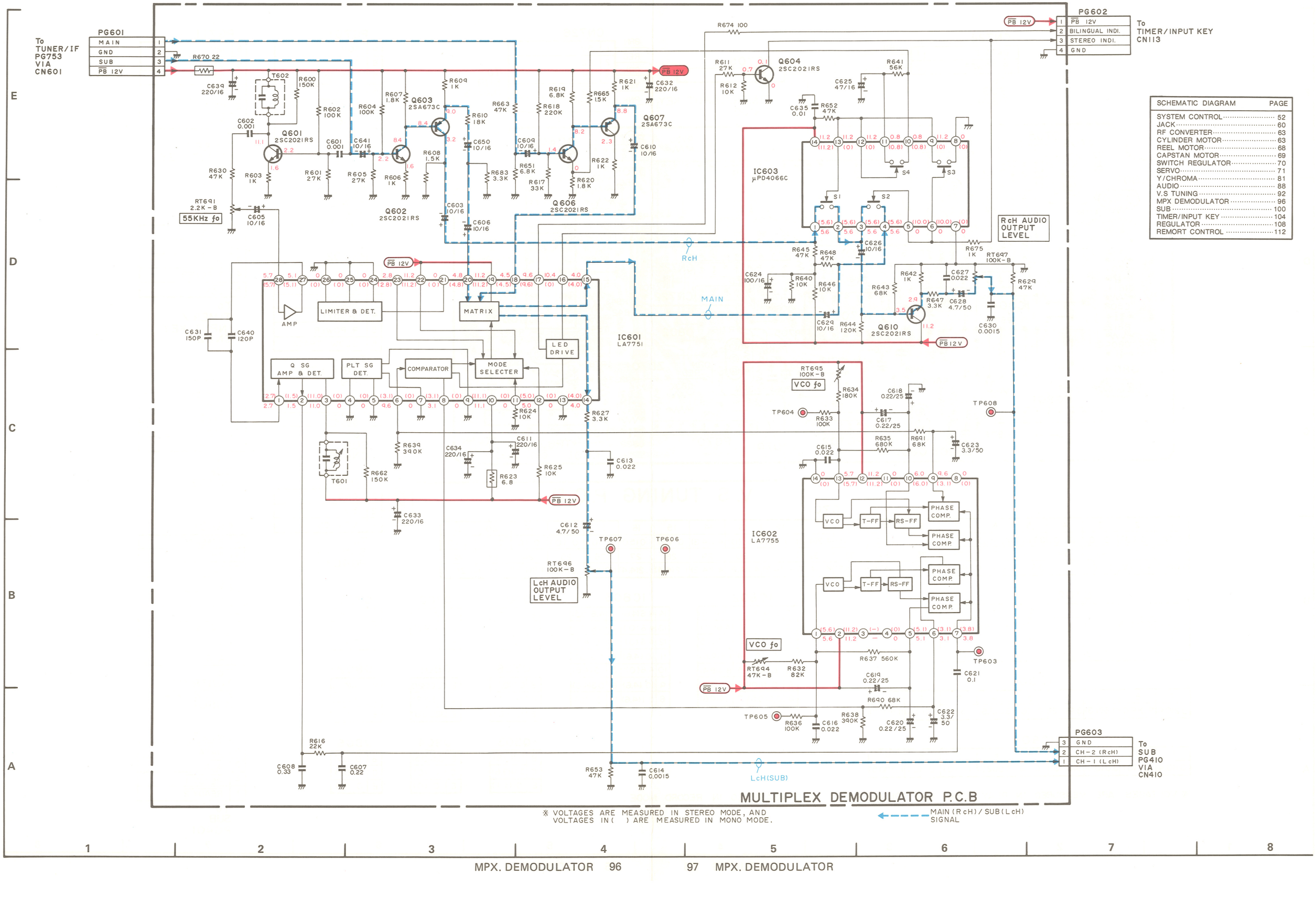
B	0.5(0.5)
C	0 (0)
E	0 (0)

Q806

B	0 (0.7)
C	1.3 (0.1)
E	0 (0)

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN( )ARE MEASURED IN RECORD MODE.

MPX·DEMODULATOR



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REGULATOR	108
REMORT CONTROL	112

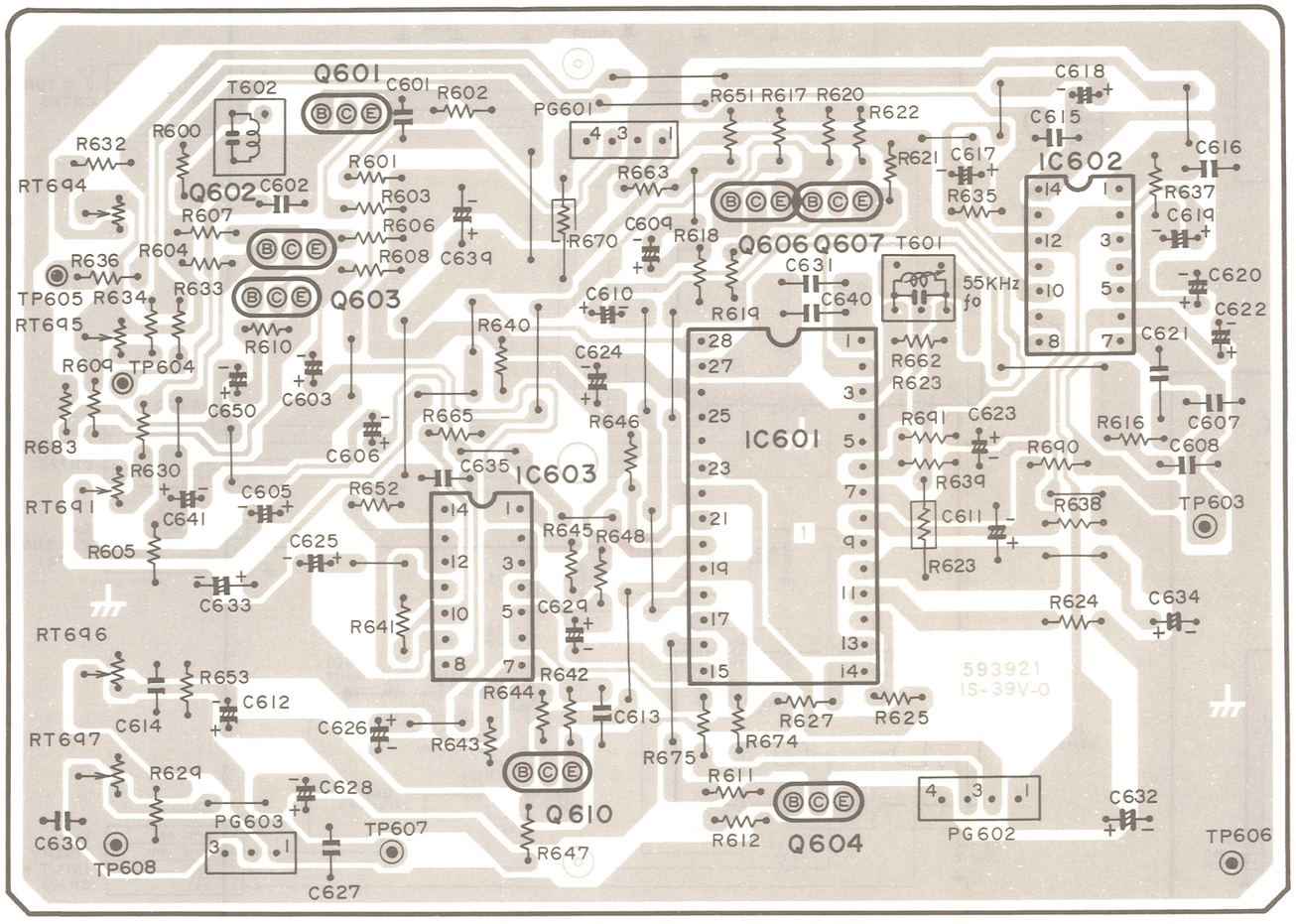
RT694
VCO
fo

RT695
VCO
fo

RT691
55KHz
fo

RT696
Lch AUDIO
OUTPUT
LEVEL

RT697
Rch AUDIO
OUTPUT
LEVEL



MULTIPLEX DEMODULATOR P.C.B

PG601

1	MAIN
2	GND
3	SUB
4	$\overline{\text{PB}}$ 12V

To
TUNER/IF
PG753
VIA
CN601

PG602

1	$\overline{\text{PB}}$ 12V
2	BILINGUAL INDI.
3	STEREO INDI.
4	GND

To
TIMER/INPUT
KEY
CN113

PG603

3	GND
2	CH-2 (Rch)
1	CH-1 (Lch)

To
SUB
PG410
VIA
CN410

IC601

28	5.7(5.7)	1	2.7(2.7)
27	5.1(5.1)	2	1.5(1.5)
26	0 (0)	3	11.0(11.0)
25	0 (0)	4	0 (0)
24	0 (0)	5	0 (0)
23	2.8 (2.8)	6	9.6(3.1)
22	11.2 (11.2)	7	0 (0)
21	0 (0)	8	3.1(3.1)
20	4.8 (4.8)	9	0 (0)
19	11.2 (11.2)	10	11.1(11.1)
18	4.5 (4.5)	11	0 (0)
17	9.6 (9.6)	12	5.0(5.0)
16	10.4 (0)	13	0 (0)
15	4.0 (4.0)	14	4.0 (4.0)

IC602

14	0 (0)	1	5.6(5.6)
13	5.7(5.7)	2	11.2(11.2)
12	11.2(11.2)	3	— (—)
11	0 (0)	4	0 (0)
10	6.0(6.0)	5	5.1(5.1)
9	9.6(3.1)	6	3.1(3.1)
8	0 (0)	7	3.8(3.8)

IC603

14	11.2(11.2)	1	5.6(5.6)
13	11.2 (0)	2	5.6(5.6)
12	11.2 (0)	3	5.6(5.6)
11	0.8(0.8)	4	5.6(5.6)
10	0.8(0.8)	5	0 (10.0)
9	11.2 (0)	6	0 (10.0)
8	0 (0)	7	0 (0)

Q601

B	2.2
C	11.1
E	1.6

Q602

B	2.2
C	8.4
E	1.6

Q603

B	8.4
C	3.2
E	9.0

Q604

B	0.7
C	0.1
E	0

Q606

B	1.4
C	8.2
E	0

Q607

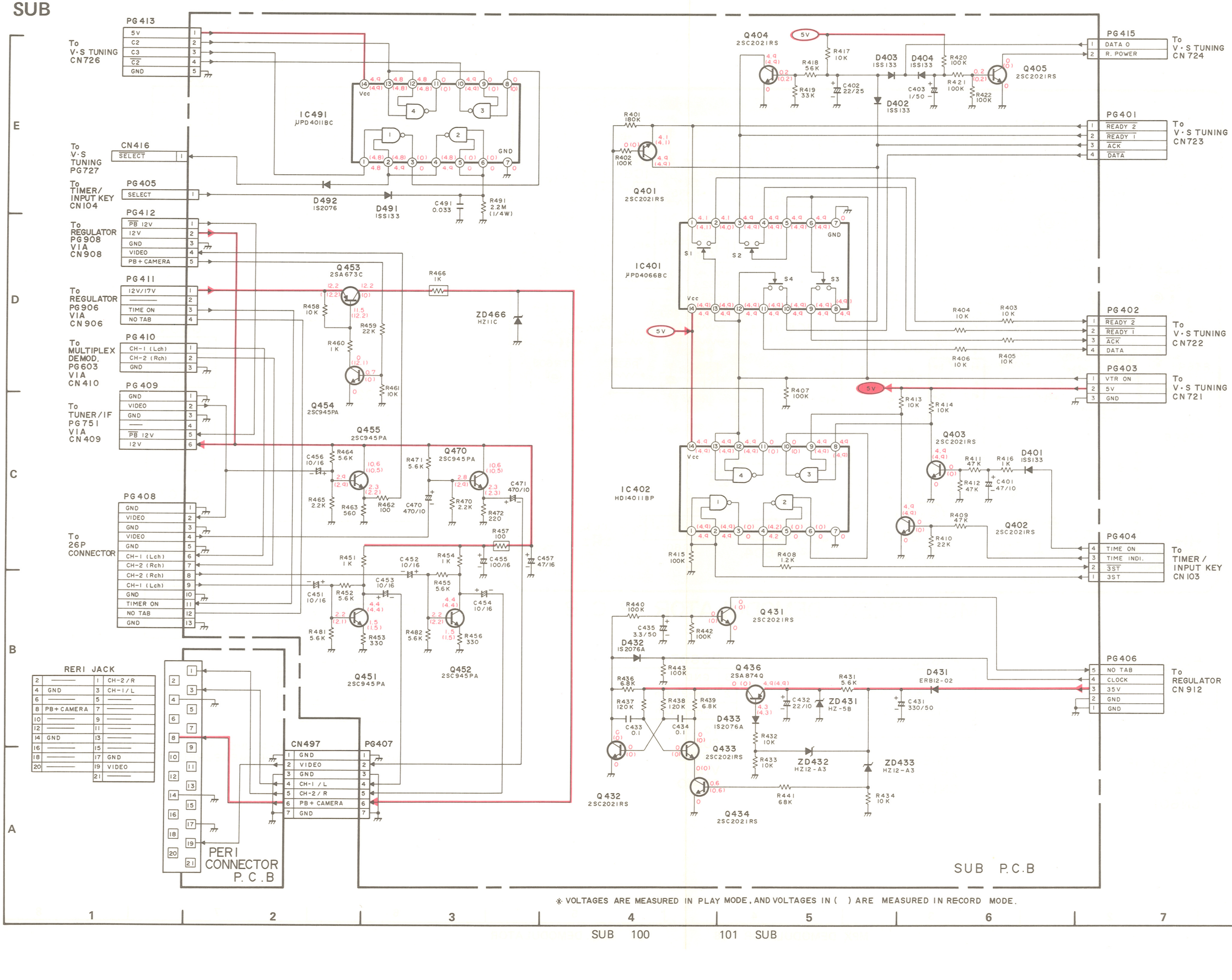
B	8.2
C	8.8
E	2.3

Q610

B	3.5
C	11.2
E	2.9

※ VOLTAGES ARE MEASURE IN STEREO MODE, AND VOLTAGES IN ( ) ARE MEASURED IN MONO MODE.

SUB



※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

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MPX DEMODULATOR	96
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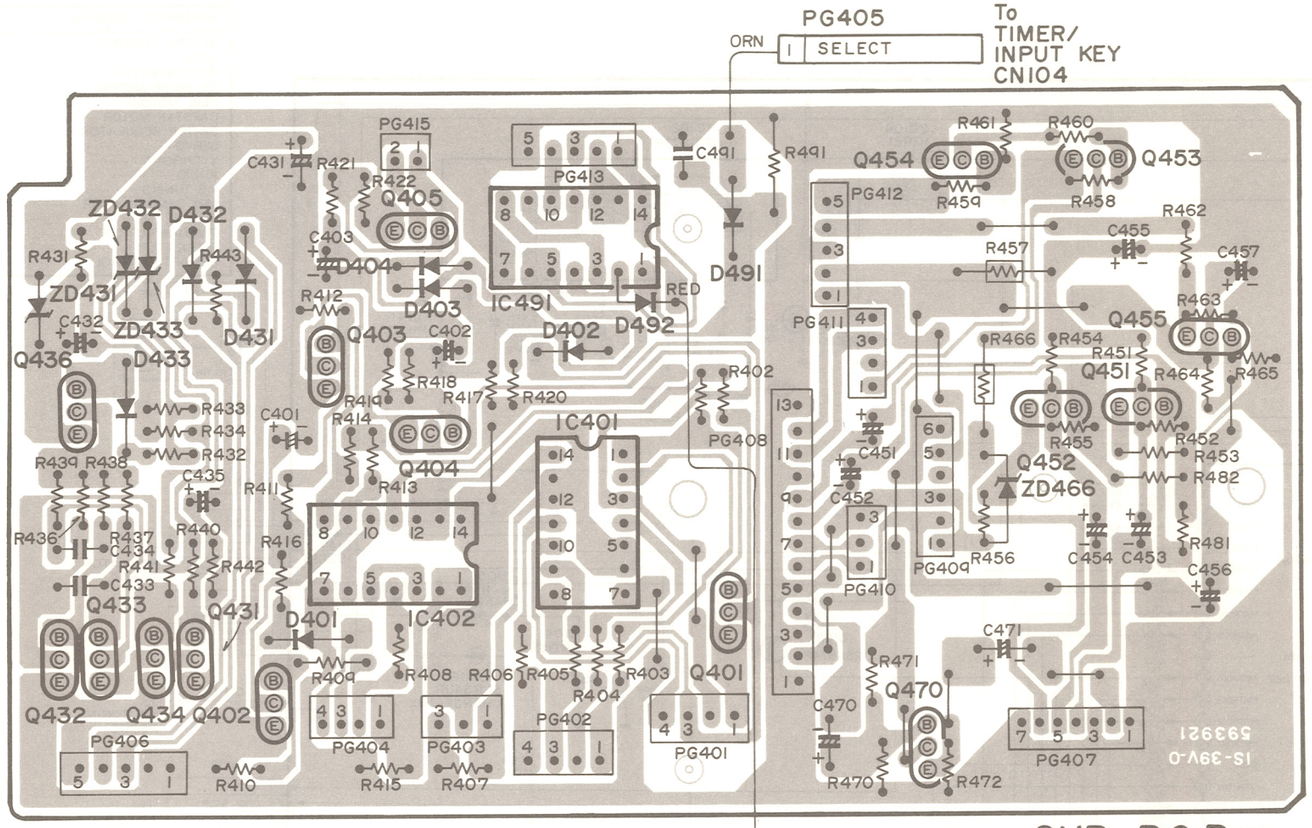
REMORT CONTROL	112



PG401

1	READY 2
2	READY 1
3	ACK
4	DATA

To V.S TUNING CN723

PG402

1	READY 2
2	READY 1
3	ACK
4	DATA

To V.S TUNING CN722

PG403

1	VTR ON
2	5V
3	GND

To V.S TUNING CN721

PG404

4	TIME ON
3	TIME INDI.
2	3ST
1	3ST

To TIMER/ INPUT KEY CN103

PG406

5	NO TAB
4	CLOCK
3	35V
2	GND
1	GND

To REGULATOR CN912

PG407

1	GND
2	VIDEO
3	GND
4	CH-1/L
5	CH-2/R
6	PB+CAMERA
7	GND

To PERI CONNECTOR CN497

PG408

13	GND
12	NO TAB
11	TIMER ON
10	GND
9	CH-1 (LCH)
8	CH-2 (RCH)
7	CH-2 (RCH)
6	CH-1 (LCH)
5	GND
4	VIDEO
3	GND
2	VIDEO
1	GND

To 26P CONNECTOR

PG409

6	12V
5	PB 12V
4	——
3	GND
2	VIDEO
1	GND

To TUNER/IF PG751 VIA CN409

PG410

3	GND
2	CH-2 (RCH)
1	CH-1 (LCH)

To MULTIPLEX DEMOD. PG603 VIA CN410

PG411

4	NO TAB
3	TIME ON
2	——
1	12V/17V

To REGULATOR PG906 VIA CN906

PG412

5	PB+CAMERA
4	VIDEO
3	GND
2	12V
1	PB 12V

To REGULATOR PG908 VIA CN908

PG413

1	5V
2	C2
3	C3
4	C2
5	GND

To V.S TUNING CN726

PG415

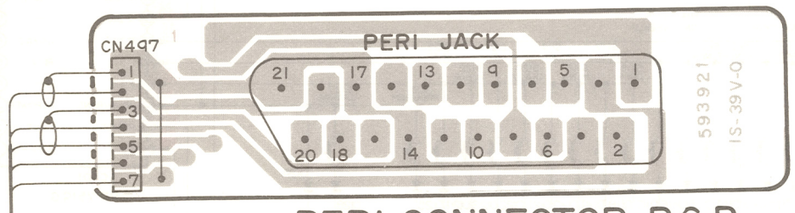
1	DATA 0
2	R.POWER

To V.S TUNING CN724

CN416

RED 1	SELECT

To V.S TUNING PG727



PERI CONNECTOR P.C.B

CN497

BLK	1	GND
WHT	2	VIDEO
BLK	3	GND
WHT	4	CH-1/L
PNK	5	CH-2/R
BLU	6	PB+CAMERA
VLT	7	GND

To SUB PG407

2	——	1	CH-2/R
4	GND	3	CH-1/L
6	——	5	——
8	PB+CAMERA	7	——
10	——	9	——
12	——	11	——
14	GND	13	——
16	——	15	——
18	——	17	GND
20	——	19	VIDEO
		21	——

Q401

B	0 (0)
C	4.9(4.9)
E	4.1(4.1)

Q431

B	0 (0)
C	0 (0)
E	0 (0)

Q451

B	2.2(2.1)
C	4.4(4.4)
E	1.5(1.5)

Q470

B	2.8(2.9)
C	10.6(10.5)
E	2.3(2.3)

IC401

14	4.9(4.9)	1	4.1(4.1)
13	4.9(4.9)	2	4.1(4.0)
12	4.9(4.9)	3	4.9(4.9)
11	4.9(4.9)	4	4.9(4.9)
10	4.9(4.9)	5	4.9(4.9)
9	4.9(4.9)	6	4.9(4.9)
8	4.9(4.9)	7	0 (0)

Q402

B	0 (0)
C	4.9(4.9)
E	0 (0)

Q432

B	0 (0)
C	0 (0)
E	0 (0)

Q452

B	2.2(2.2)
C	4.4(4.4)
E	1.5(1.5)

IC402

8	9	10	11	12	13	14
4.9(4.9)	4.9(4.9)	0 (0)	0 (0)	4.9(4.9)	4.9(4.9)	4.9(4.9)
7	6	5	4	3	2	1
0 (0)	0 (0)	0 (0)	4.2(4.2)	0 (0)	4.9(4.9)	4.9(4.9)

Q403

B	0 (0)
C	4.9(4.9)
E	0 (0)

Q433

B	0 (0)
C	0 (0)
E	0 (0)

Q453

B	11.5(12.2)
C	12.2(0)
E	12.2(12.2)

IC491

8	9	10	11	12	13	14
0 (0)	0 (0)	4.9(4.9)	0 (0)	4.8(4.8)	4.8(4.8)	4.9(4.9)
7	6	5	4	3	2	1
0 (0)	0 (0)	0 (0)	4.9(4.8)	0 (0)	4.9(4.8)	4.8(4.8)

Q404

B	0.2(0.2)
C	4.9(4.9)
E	0 (0)

Q434

B	0.6(0.6)
C	0 (0)
E	0 (0)

Q454

B	0.7 (0)
C	0 (12.1)
E	0 (0)

Q405

B	0.2(0.2)
C	0 (0)
E	0 (0)

Q436

B	4.3(4.3)
C	0 (0)
E	4.9(4.9)

Q455

B	2.9(2.9)
C	10.6(10.5)
E	2.3(2.2)

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TIMER/INPUT KEY

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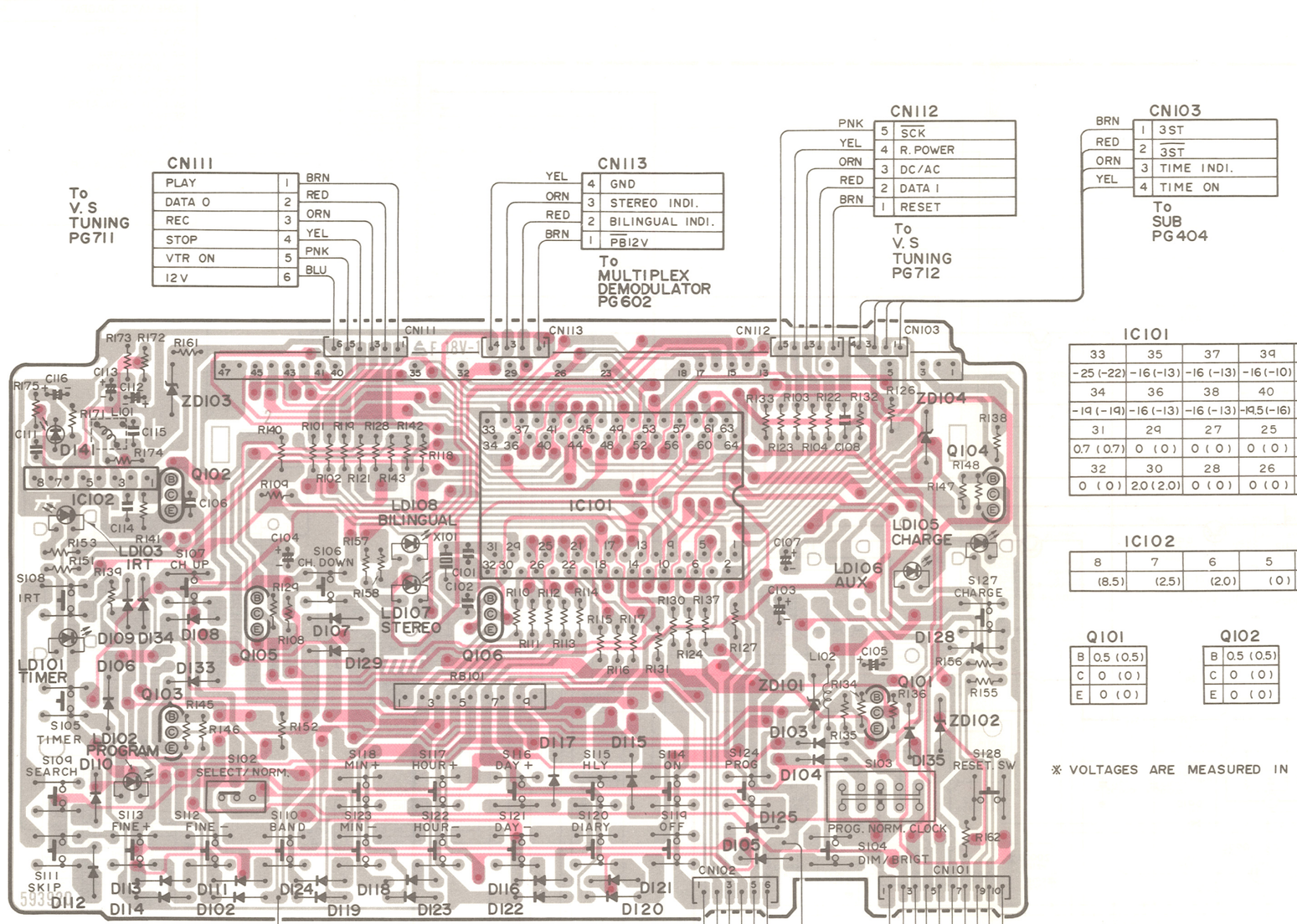
NOTE: DTC124F

TIMER/INPUT KEY P.C.B

※VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN( ) ARE MEASURED IN RECORD MODE.



IC101

33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63
-25 (-22)	-16 (-13)	-16 (-13)	-16 (-10)	0 (0)	0 (0)	4.6 (0)	-23(-23)	-23 (-23)	-23 (-23)	-23(-23)	-23(-23)	-23(-23)	-29(-29)	4.6 (4.6)	0 (0)	0 (0)
34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64
-19 (-19)	-16 (-13)	-16 (-13)	-19.5(-16)	0 (4.5)	0 (4.8)	4.6 (0)	-23(-23)	-23(-23)	-23(-23)	-23(-23)	-23(-23)	-23(-23)	-3.2(-3.2)	0 (0)	0 (0)	4.8 (4.8)
31	29	27	25	23	21	19	17	15	13	11	9	7	5	3	1	
0.7 (0.7)	0 (0)	0 (0)	0 (0)	0 (0)	4.2 (4.1)	0 (4.6)	4.9 (0)	4.2(0.4)	0 (0)	0 (0)	4.7 (4.7)	0 (0)	0 (0)	0 (0)	0 (0)	
32	30	28	26	24	22	20	18	16	14	12	10	8	6	4	2	
0 (0)	2.0 (2.0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (4.9)	4.2 (4.2)	0 (0)	4.7 (4.7)	0 (0)	3.2 (3.2)	4.2 (4.2)	0 (4.7)	4.2 (4.2)	

IC102

8	7	6	5	4	3	2	1
(8.5)	(2.5)	(2.0)	(0)	(7.2)	(8.5)	(1.0)	(0.5)

Q101

B	0.5 (0.5)
C	0 (0)
E	0 (0)

Q102

B	0.5 (0.5)
C	0 (0)
E	0 (0)

Q103

B	0 (0)
C	0 (0)
E	0 (0)

Q104

B	0.6 (0)
C	0 (0)
E	0 (0)

Q105

B	0 (0.2)
C	4.2 (4.2)
E	0 (0)

Q106

B	0 (0)
C	4.2(0.4)
E	0 (0)

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN( ) ARE MEASURED IN RECORD MODE.

REGULATOR

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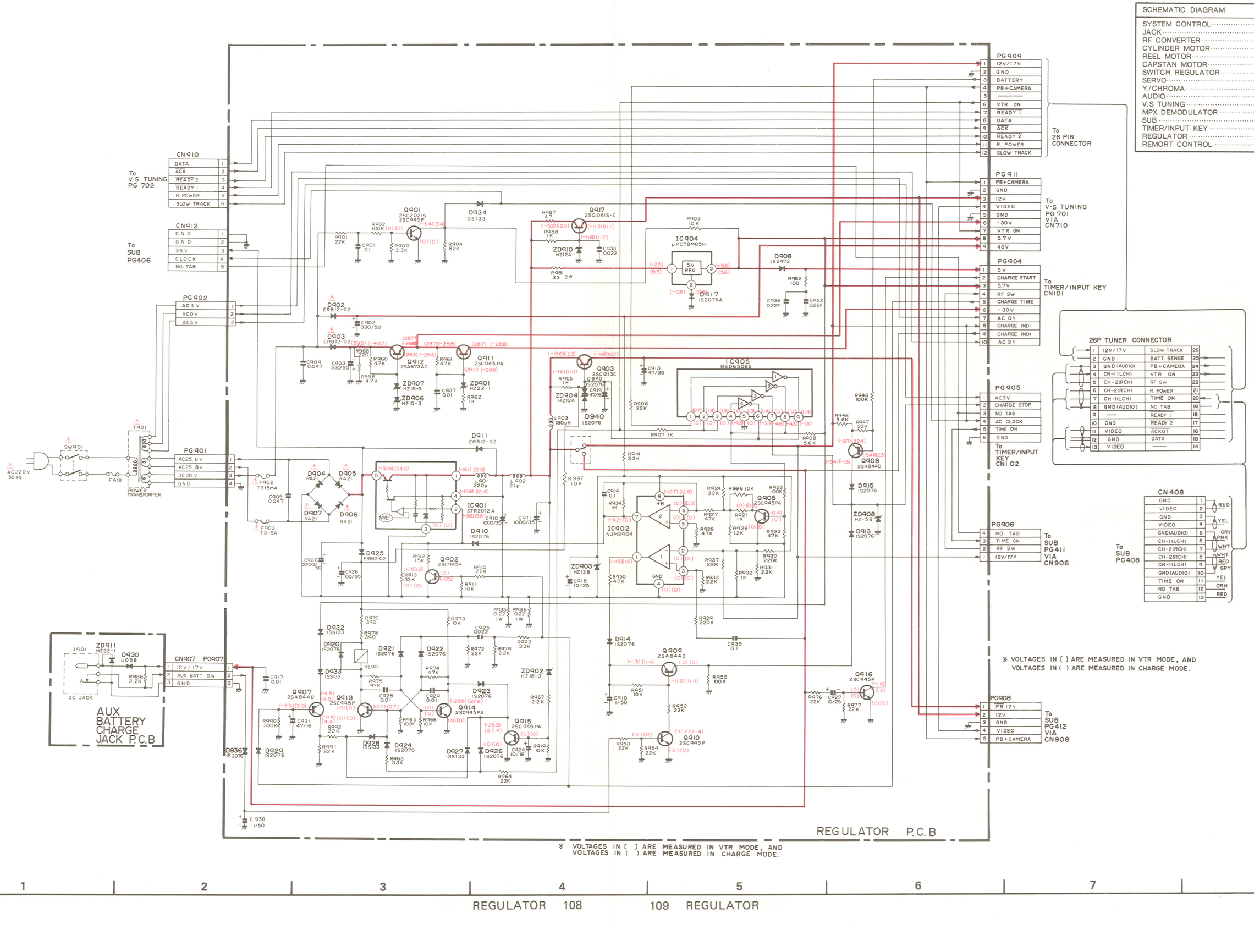
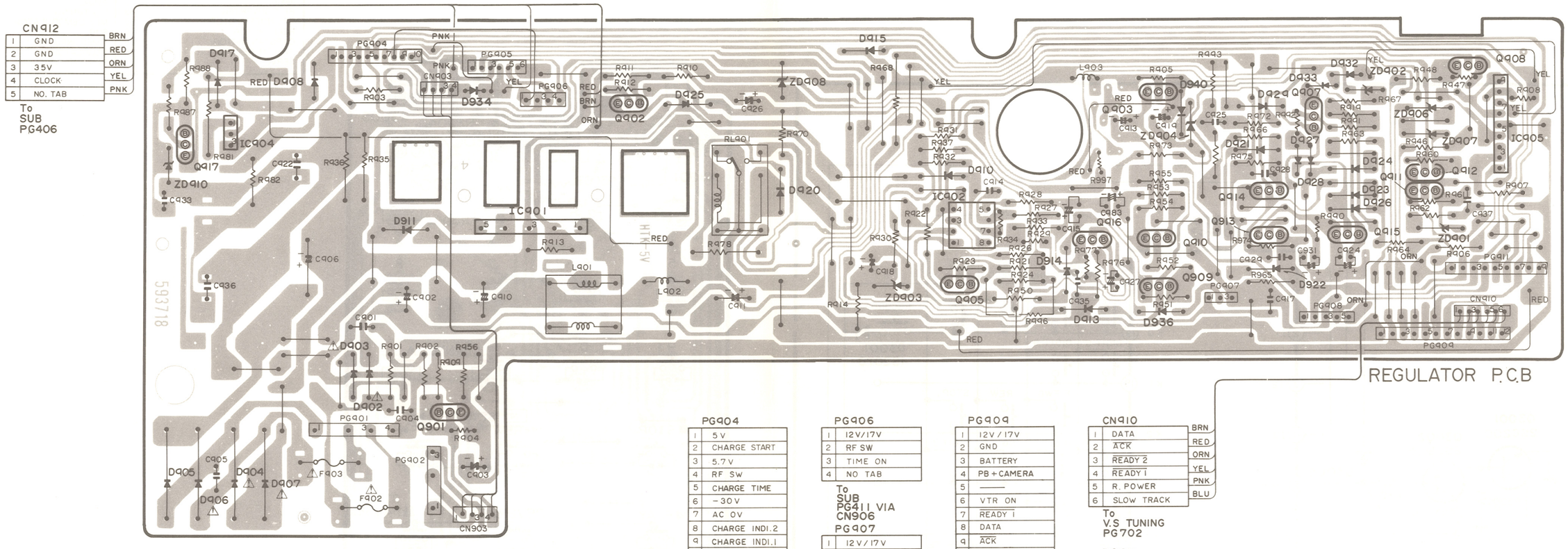
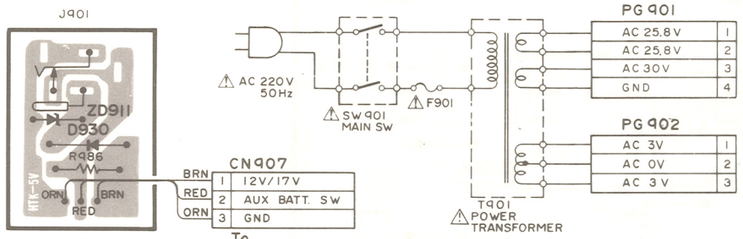






PG904

1	5V
2	CHARGE START
3	5.7V
4	RF SW
5	CHARGE TIME
6	−30V
7	AC 0V
8	CHARGE INDI.2
9	CHARGE INDI.1
10	AC 3V

To TIMER/INPUT KEY CN101

PG905

1	AC 3V
2	CHARGE STOP
3	NO TAB
4	AC CLOCK
5	TIME ON
6	GND

To TIMER/INPUT KEY CN102

PG906

1	12V/17V
2	RF SW
3	TIME ON
4	NO TAB

To SUB PG411 VIA CN906

PG907

1	12V/17V
2	AUX BATT. SW
3	GND

To BATTERY CHARGE JACK CN907

PG908

1	PB 12V
2	12V
3	GND
4	VIDEO
5	PB+CAMERA

To SUB PG412 VIA CN908

PG909

1	12V/17V
2	GND
3	BATTERY
4	PB+CAMERA
5	——
6	VTR ON
7	READY 1
8	DATA
9	ACK
10	READY 2
11	R. POWER
12	SLOW TRACK

To 26 PIN CONNECTOR

CN910

1	DATA BRN
2	ACK RED
3	READY 2 ORN
4	READY 1 YEL
5	R. POWER PNK
6	SLOW TRACK BLU

To V.S TUNING PG702

PG911

1	PB+CAMERA
2	GND
3	12V
4	VIDEO
5	GND
6	−30V
7	VTR ON
8	5.7V
9	40V

To V.S TUNING PG701 VIA CN710

Q901

B	(0) (0)
C	(-3.4) (3.4)
E	(0) (0)

Q902

B	(-0.5) (0)
C	(0) (3.8)
E	(0) (0)

Q903

B	(-0.1) (1.4)
C	(-15.6) (12.3)
E	(-1.4) (0.7)

Q905

B	(-0.4) (0)
C	(0) (0.3)
E	(0) (0)

Q907

B	(-3.9) (3.9)
C	(-4.4) (4.4)
E	(-4.5) (4.5)

Q908

B	(-5.4) (12.3)
C	(-5.4) (-1.3)
E	(-6.0) (2.4)

Q909

B	(-11.3) (11.4)
C	(0) (0)
E	(-11.3) (11.4)

Q910

B	(0) (0)
C	(-11.2) (11.4)
E	(0) (0)

Q911

B	(28.0) (-28.8)
C	(28.7) (-28.8)
E	(28.7) (-28.8)

Q912

B	(29.3) (-29.4)
C	(39.5) (-40.7)
E	(28.7) (-28.8)

Q913

B	(-0.7) (0.7)
C	(0) (0)
E	(0) (0)

Q914

B	(0) (0)
C	(-28.8) (27.6)
E	(0) (0)

Q915

B	(0) (0)
C	(-28.5) (27.4)
E	(0) (0)

Q916

B	(0) (0)
C	(-1.0) (1.2)
E	(0) (0)

Q917

B	(-11.8) (11.7)
C	(-15.2) (12.0)
E	(-11.3) (11.1)

IC901

5	4	3	2	1
(-30.9) (34.0)	(-15.8) (12.4)	(0) (0)	(-3.6) (3.8)	(-16.1) (12.5)

IC902

4	(0) (0)	5	(0) (0)
3	(0) (0)	6	(0) (0.3)
2	(0) (0)	7	(-4.2) (0)
1	(-11.5) (11.6)	8	(-12.7) (12.8)

IC904

1	(12.5) (9.3)
2	(-5.6) (5.6)
3	(-0.6) (0.6)

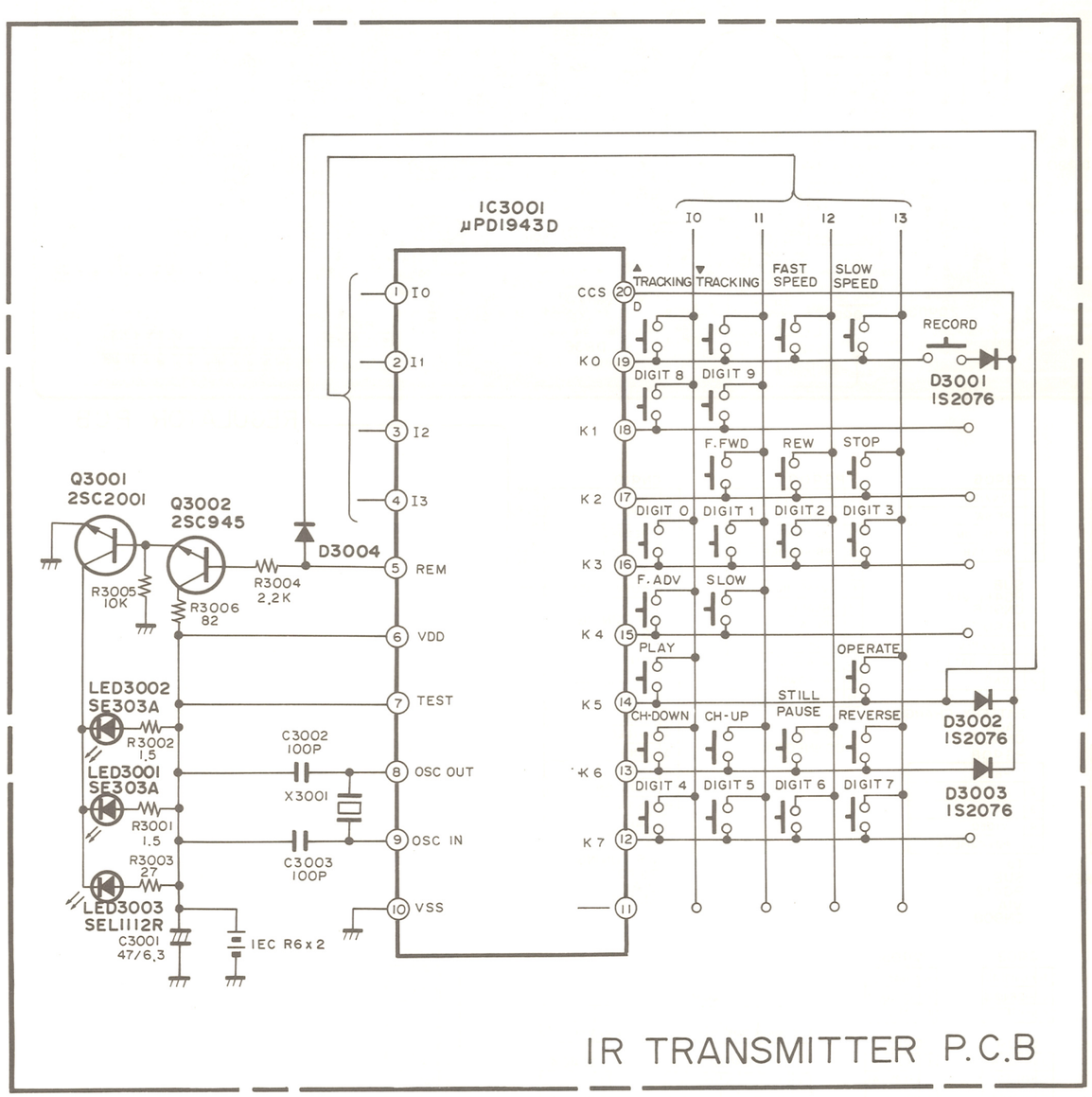
IC905

9	(-0.1) (11.4)
8	(-4.3) (0)
7	(-4.8) (0)
6	(-0.1) (11.4)
5	(0) (0)
4	(-4.3) (0)
3	(0) (1.9)
2	(0) (1.9)
1	(0) (0.7)

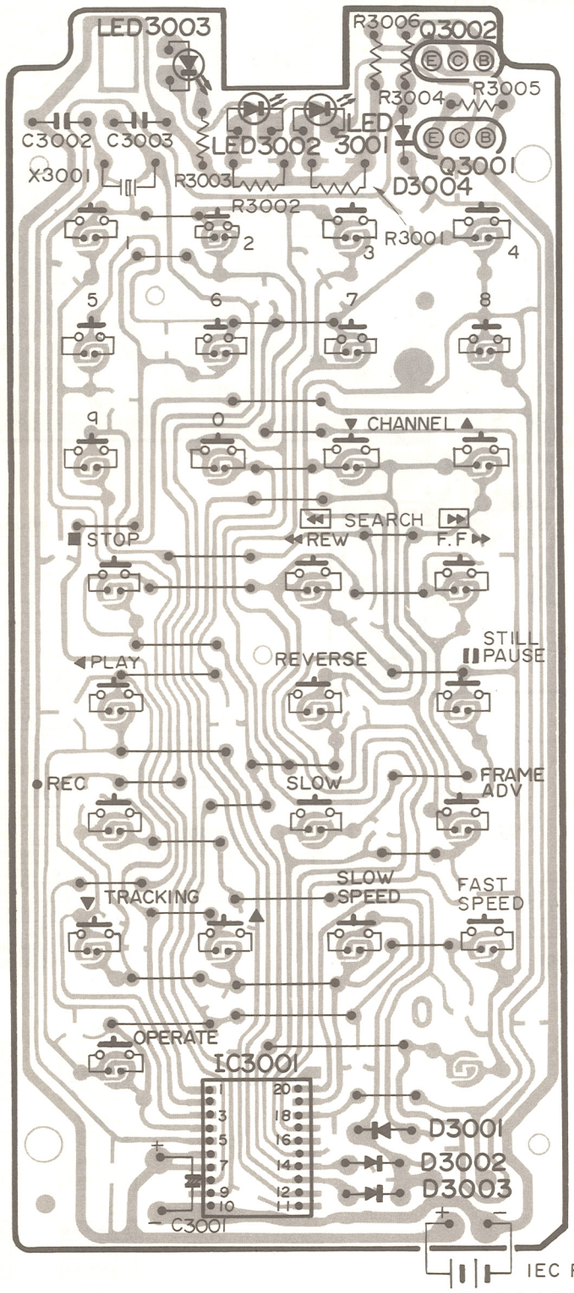
* VOLTAGES IN ( ) ARE MEASURED IN VTR MODE, AND VOLTAGES IN ( ) ARE MEASURED IN CHARGE MODE

REMOTE CONTROL

SCHEMATIC DIAGRAM	PAGE	SCHEMATIC DIAGRAM	PAGE
SYSTEM CONTROL	52	Y/CHROMA	81
JA€K	60	AUDIO	88
RF CONVERTER	63	V.S TUNING	92
CYLINDER MOTOR	63	MPX DEMODULATOR	96
REEL MOTOR	68	SUB	100
CAPSTAN MOTOR	69	TIMER/INPUT KEY	104
SWITCH REGULATOR	70	REGULATOR	108
SERVO	71	REMORT CONTROL	112



IR TRANSMITTER P.C.B



IR TRANSMITTER P.C.B